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THE DENTAL DIGEST

**A Monthly Summary of Dental Science Devoted
to the Progress of Dentistry.**

THE OFFICIAL ORGAN OF THE

National Dental Association,

**Dental Protective Association,
Missouri State Dental Association,
Wisconsin State Dental Society,
Vermont State Dental Society,
Rochester Dental Society,**

**Illinois State Dental Society,
Michigan State Dental Association,
Kentucky State Dental Association,
Cincinnati Odontological Society,
Northern Ohio Dental Society, Etc.**

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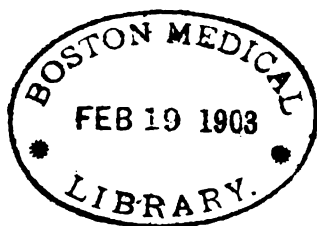


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GOLD FILLING, A RETROSPECT.

BY H. H. JOHNSON, D.D.S., MACON, GA. READ BEFORE SOUTHERN BRANCH
NATIONAL DENTAL ASSOCIATION, AT NASHVILLE, JULY 29-31, 1901.

Since the days when dentistry had a beginning the various preparations of gold have been accorded a place as the most important of materials for filling cavities of decay in human teeth. It is interesting to note the many changes it has undergone during all these years in methods of manufacture and manipulation, each change being made in an attempt to lessen the tediousness of its working qualities and to increase its effectiveness as a tooth preserver. That gold has been able to retain its place in the estimation of operators of all periods as the first and best of filling materials, no matter what form or method be employed, is evidence that it is thus far entitled to the name of king of filling materials as well as king of metals.

Previous to about 1850 gold was employed for "plugging," as it was then termed, in the form of soft or noncohesive foil. It was very desirable that the foil should have no "adhesive or sticky" qualities, but should work perfectly soft and pliable. Hand pressure was the force employed for condensing the "plug," and the wedging principle was used for retaining it in place. Mallet force was not used until some time about 1864. In the *Cosmos*, 1865, in an article by Dr. I. J. Wetherbee, read before the Massachusetts Dental Association, condemning the use of the mallet, he uses these words—"It is but recently or at most a few years only that the mallet has been in use. I think to Wm. H. Atkinson, M.D., then of Cleveland, Ohio, but now residing in the city of New York, is due the honor of introducing it to public notoriety." In speaking further of it he says, "A mallet is a well turned and nicely formed piece of *lignum vitae* or *rosewood*, and is as harmless as quack medicine when let alone."

The cohesive property of gold was known to the manufacturers many years before it was employed by the dentists in that state, but the latter demanded a strictly noncohesive gold and the manufacturers found it difficult to always comply with the demand. Often they had to take back "sticky" gold and work it over again. In writing for the *Cosmos* in 1863 Amos Westcott made the statement that he had accidentally discovered the cohesiveness of gold as early as 1840, by having some sent him by mail with the leaves of paper removed from between the sheets to save postage. The pressure in the mail sack caused the whole batch to stick together, and the manufacturers gave other gold for it, thinking the fault was theirs. He made no mention of nor profited by his discovery, and therefore did not get credit for it as he might have done. A few months later Dr. Louis Jack took Dr. Westcott to task for claiming the discovery, contending that it rightfully belonged to Dr. Robt. Arthur, who on making the discovery realized its importance and immediately made use of it, publishing the fact to the world about 1855, showing that liberal spirit which a strictly professional man must possess.

This was the first period in the history of gold as a filling material. It was before the dental engine and the rubber-dam, yet it cannot be doubted for a moment that success crowned the efforts of these operators in the greater number of cases treated, even under the trying and almost distressing circumstances under which they labored in those days. Let it be remembered that this is a strong argument in favor of noncohesive gold and hand pressure.

Now comes a new era in which crystal gold and other fibrous cohesive golds made their appearance. The profession took to this new form as the trout seizes the tempting bait on the treacherous hook. It seemed just what they had been looking for—a soft, plastic, cohesive gold that could be worked by hand pressure. It soon proved, however, to be somewhat of a snare and a delusion, many failures rapidly following its use, principally, no doubt, from improper pluggers and inexperience in manipulation.

The third era, about 1863, saw the advent of the rubber-dam, the mallet, strictly cohesive foil and contour filling. Those who were bold enough to experiment with this new process were soon ready to cry out *Eureka!* The old soft foil and hand pressure gradually gave way to the more modern cohesive foil and hand-mallet force.

Then came the improved forms of pluggers, the machine and electric mallets, and from about 1880 to 1890 a man was an old fogey indeed who used anything but cohesive gold and mallet force. Through all these different periods and stages of development it must be remembered that gold persistently held its supremacy as a filling material. With the advent of cohesive gold, however, and the long tedious operations necessary in its manipulation, the tired backs of the profession gradually turned for relief to the once despised amalgam. The state into which the profession had drifted gave this unscientific material a stimulus it had not known before.

But it soon became apparent that these beautiful cohesive jewels, so carefully hammered into place with the most modern pounding machinery, would in some unaccountable way become in many instances undermined by a recurrence of decay, principally at the cervical margins. The scientific investigators of the profession, to meet this last exigency, have resorted to the latest practice of "extension for prevention." It remains for experience to demonstrate what fruits this bold method will bring forth. While not dealing in this paper with cavity preparation, it may not be out of place to state that extension for prevention, in the fullest acceptance of the term as taught by those who practice it, is not concurred in to any very great extent. The cases are not plentiful where it can be practiced with good judgment, and in some of these it should not be done for esthetic reasons.

Let us consider the successes and failures attending the first period of the use of gold as a filling material. The form of gold used at this time was strictly noncohesive and the force exerted for condensation only hand pressure. The practice of extension for prevention could not have been followed, as it would have been impossible to have so shaped the cavities with the excavating instruments then in use. There was but one rule in cavity preparation—break down weak enamel walls, remove decay and make the cavity larger at the base than at the orifice. The gold in ropes and ribbons was packed in by hand pressure and finished by burnishing the surface. Such fillings were remarkably immune from a recurrence of decay, especially at the cervical margin. Where failure resulted it was from a battering down of the surface when subjected to severe attrition, until an exposure of dentin at one of these points would induce decay, either at the occlusal surface or at the labial or

lingual margin. Who of us has not marvelled at the way such fillings have preserved teeth even after the latter have disintegrated to such an extent as to afford lodgement for food stuffs and bacteria in great quantity? To such a degree has this been the case that some mysterious therapeutic value has at different times been ascribed to noncohesive foil.

With the advent of cohesive gold the great annoyance of fillings breaking down from attrition was at once overcome and the ideal seemed for a time to have been reached. This was not to be, however, for ever since the introduction of cohesive gold and mallet force the profession has been harrassed by having these beautiful fillings, which required hours of patient toil from the dentist and stacks of nerve force on the part of the patient, become undermined at the cervical and labial margins and fall out—a welded polished lump of gold, with the support crumbled away as a wall built on a sand foundation.

The prediction is now made, that the next advance will be begun when we weigh the experience of the profession and profit by the principles which seem to have been proven. The high ideal hoped for will not be secured by inflicting undue punishment in burring away the strength and beautiful geometric form of the tooth in trying to get beyond a vulnerable point, but by combining modern instrumentation and skill with the two best forms of gold and the two best forces for condensation. Each of these methods has demonstrated by long experience that it possesses many virtues when rightfully used. This being true, let us use them in combination and reap the benefit of both. Pack noncohesive gold with hand pressure at these vulnerable points, thereby securing unmistakable adaptation, then finish with cohesive gold, thus obtaining the hardness and solidity necessary to resist the force of mastication, and the ideal method for the salvation of teeth, based on the experience of the past seventy-five years, will have been reached. It is not so much the extension of the cavity but adaptation that is most needed, and cohesive gold cannot be adapted to small inaccessible cavities. It is only in broad open cavities that cohesive gold can be successfully manipulated, hence the necessity for "extension for prevention" when this form of gold and mallet force is employed exclusively.

While not ready to make the assertion, the suggestion is advanced,

that many failures of gold fillings from faulty adaptation are due to too much mallet force directly against the cavity walls in beginning the filling. This does not allude to the crumbling of the enamel rods under the blows of the mallet, but because it is going against a mechanical principle to endeavor to obtain an absolute adaptation to a resilient wall by driving a substance of the nature of cohesive foil directly against it with a mallet. Ivory will stand a severe pounding without injury, and at the same time it is the most resilient substance known. For this reason it is selected for making billiard balls and other things requiring this property to a great extent. If a piece of ivory be struck with a solid substance there is an immediate violent rebound, owing to its resiliency. If it be attempted to drive a piece of solid welded cohesive gold against its surface there is a rebound at every blow of the hammer, and the more solid and dense the welded mass becomes the more violent the rebound. It is therefore a practical impossibility to drive a layer of cohesive gold into absolute contact with it. If the process of condensation is not complete there is imperfect contact, and if carried to completion, so as to produce a state of solidity, there is incomplete contact because of the resiliency excited by the blows of the mallet. On the other hand, when steady firm pressure, as from the hand, is applied to a like substance, this resilient property is not excited and the materials may be pressed and packed into absolute contact with it. So, if with hand pressure we pack noncohesive gold into all the vulnerable points and around the cavity walls, until a mass of sufficient thickness to break the force of the impacting mallet has been condensed in this manner, cohesive gold may then be driven into it without the ill effects of the rebounding, as there is a non-resilient cushion to break the force of the mallet.

Discussion. *Dr. Wm. Crenshaw*, Atlanta: If a man could have only one kind, cohesive gold would be the best. I do not agree with *Dr. Johnson* that it is impossible to adapt cohesive gold closely to the margin of inaccessible cavities, for a large number of men have become expert by practice and can do it successfully. The latest and best method, however, is to use a combination of the two styles of gold. I formerly believed that cohesive gold was the best material for all parts of all cavities, but I now willingly acknowledge that noncohesive gold is the best for cervical margins of fillings. Regarding "extension for prevention," we all know that the point of

contact of the teeth is where decay is most likely to occur, and if the margin of the filling comes at that point there is bound to be trouble. The cavity margin should preferably be half way between point of contact and gum. If it is at the gum line the same objection exists as at the point of contact of the teeth, so it is better practice to extend cavity under the edge of gum than to stop at it.

Dr. Frank Holland, Atlanta: I differ materially from the essayist, for an experience of twenty years with cohesive gold has convinced me that its value as a filling material cannot be surpassed. After seeing the work of Varney, Webb, and others, no one can deny that cohesive gold can be thoroughly packed with hand pressure against the cervical margins of a cavity extending to the neck of the tooth. The combination fillings described have not been successful in my hands, and I fail to see their value, as cohesive gold can be adapted to any case where soft gold could be used. It is sometimes almost impossible to so form a cavity that it will receive and retain soft gold, and the pressure brought to bear on the tooth in inserting such a filling is so great as to endanger it.

Dr. W. V. B. Ames, Chicago: Those discussing this paper seem to recognize only thoroughly noncohesive and thoroughly cohesive gold, but there are many gradations of working quality between the two, and therein lies the opportunity for Dr. Johnson's argument. "Extension for prevention" is what Webb taught years ago, but Dr. Black has amplified and extended it. Approximal cavities should be extended so as to bring the margins safely away from the point of contact and to make the filling of cavities simpler, but all cavities should not be extended to the degree of making them accessible to straight instruments.

Dr. R. K. Luckie, Holly Springs, Miss.: There is such a difference in the quality of teeth and in the way various people take care of their mouths, that no set rule for preparing cavities can be laid down, but "extension for prevention" should be carried out to a certain degree in most cases. In approximal cavities the gingivobuccal or buccal or lingual angles should be extended freely whenever indicated. Better results also come from lateral extension, especially in teeth that are prone to decay. The mere fact of extending the cavity margin below the gum does not always save the tooth at that point, and it is not always so necessary to extend the gingival border.

Dr. W. J. Morrison, Nashville: We often see fillings of noncohesive gold that have been rendering good service and preserving the teeth for twenty or thirty years, but cohesive gold fillings rarely last more than half that time. This would seem to indicate that there is a more perfect adaptation of the soft gold to the walls and margins of the cavity than can be obtained with cohesive gold. Many claim that there is something of a therapeutic value in noncohesive gold that prohibits the recurrence of decay. The use of both styles of gold in combination promises better results than can be expected from either alone.

Dr. Sims: Dr. Holland claims that it is necessary to extend cavities more to receive a noncohesive gold filling than a cohesive one, but I do not think this is so. It seems to me that an approximal filling with a noncohesive base and a cohesive finish can be depended upon to preserve a tooth with less extension than any other filling, because the soft gold so thoroughly protects the margins.

Dr. A. G. Finney, Wilkesbarre, Pa.: I believe better results can be obtained from cohesive gold, and if we should study the nature of this material, and adopt our methods and instruments to its peculiarities, we would get better results.

Dr. W. E. Walker, Pass Christian, Miss.: Many of the failures of these combination fillings are due to the fact that too thick a mat of soft gold is left at the margin. Dr. Black showed me that the continued impact of mastication would still further condense the noncohesive gold under it, and thus allow the cohesive gold to settle away from the margins.

Dr. J. Y. Crawford, Nashville: The difficulty many have in using the different styles of gold comes from the fact that the proper instruments and methods are not adopted. At first we used noncohesive gold with hand pressure and special instruments, and when cohesive gold was introduced the same instruments and methods were used, so failure of course resulted. There is no doubt that noncohesive gold in contact with the walls and margins of cavities is a better preservative of tooth substance than cohesive gold, and an ideal filling is one that has a foundation of the first and a superstructure of the second. Nowadays many dentists in making these fillings are trying to use the same instruments and methods for both styles of gold, and failures are bound to occur.

A common sense plan in inserting a filling to preserve a tooth is to remove all decay and then so shape the cavity as to best retain the filling, adapting the latter to the nature of the tooth. The usefulness of a filling often depends upon the vitality of a tooth, and decay of a pulpless tooth is not analogous to caries in a living one.

Dr. Johnson, closing discussion: While not condemning "extension for prevention," I do not use it to any great extent. I believe it is Dr. C. N. Johnson who says that a cavity filled so as to have the margin of the filling extend beneath a healthy gum will never show recurrence of decay at that point. Probably it would not if the gum resumed and maintained a perfectly healthy condition, but I have never seen a healthy normal gum margin which extended over the filling.

MANAGEMENT OF THE PERMANENT SUPERIOR INCISORS AND CUSPIDS.

BY L. G. NOEL, D.D.S., NASHVILLE. READ BEFORE SOUTHERN BRANCH NATIONAL DENTAL ASSOCIATION, AT NASHVILLE, JULY 29-31, 1901.

We believe no one will dispute the statement that cavities occurring in these teeth prior to the age of sixteen should be filled with cement or gutta-percha. Tin foil has been advocated by some very eminent authorities, but, admitting its low-conducting qualities and its benign therapeutic effect upon the dentin, it has not the easy working quality nor the adhesive properties of either of the above mentioned materials. It requires as much undercutting to retain it as gold, and it is as difficult to place. At this early age (eight to sixteen) we especially desire to avoid deep undercutting—we wish to remove only the decalcified and infected tissue, and we do not wish to pursue this in the direction of the pulp to the point of its exposure, preferring to trust to the therapeutic effects of our medicaments and filling material to convert this into a natural capping that will not prove inimical to the life and health of the pulp. Another serious objection to tin foil in the front teeth is its color and tendency to blacken in some cases, not only staining the surrounding tooth structure but indelibly pigmenting the gum tissue as well. We recognize the excellent qualities of this for other situations, but for these cases we have something better. Excluding tin brings us to a consideration of gutta-percha and cement.

Before entering upon this we must say a few more words about

Cavity preparation. These materials being plastic and easily introduced, we do not need to cut away the lingual wall of enamel for access, as in making preparation for gold fillings, but we desire to leave as much of the enamel margin as will protect the filling from abrasion in the friction of mastication or biting of food. This is an important point to observe in the preparation of cavities for cement or gutta-percha fillings, since the latter are soft and offer little resistance. Gutta-percha, if of good quality and not overheated will, when carefully introduced and well protected by the enamel margins, sometimes last ten years in proximal cavities in the front teeth, and since it has the least power of conducting heat and electric currents of all filling materials yet employed, it is perhaps the best agent we have for proximal cavities in the incisors and cuspids of young patients. The teeth should be well separated with thin, wide separating rubbers that will engage between the knuckles so as not to ride upon the gum septum. This separation should be maintained by forcing a bit of folded cardboard between the teeth until the soreness has subsided. Having obtained a satisfactory separation, and having decided upon gutta-percha fillings, our method of introducing them may be briefly described. We adjust the rubber-dam with great care, because dryness is essential. The edges are carefully everted and tucked under the margin of the gum by the silk ligatures, which are secured by the surgeon's knot. We next select a separator to steady the teeth and maintain the space. The preparation of the cavity is a very simple thing when conducted as above described, our attention being turned to the mere removal of decay and smoothing of enamel margins, no undercuts being required, save such as may be left by this procedure. A bit of cuttlefish tape will be found useful in smoothing the enamel borders. We next paint the whole surface of the cavity with a solution of resin in chloroform. This serves a double purpose—it covers the surface of the sensitive dentin with a coating that protects the freshly cut dentinal fibrillae from irritants, and it affords a glue or adhesive cement for fastening the gutta-percha to the walls of the cavity. This is a decided aid in introducing the first small pellets of material, since they cling to the wall of the cavity and are worked into place without moving.

The instruments for working the gutta-percha are few and simple, and have been too often described in text-books to require more than

mere passing notice here. Such small serrated pluggers as are found useful in working gold will be serviceable in carrying the material into place. For a detailed description of the instruments and appliances needed in making gutta-percha fillings see Flagg's "Plastics and Plastic Fillings." We cannot lay too much stress upon the importance of not overheating the material, for however excellent it may be when it comes to the hands of the dentist, if heated too hot its color and all other good qualities will be quite destroyed. Many times failure has been due to a neglect of this caution, and the material has been blamed when the fault lay with the operator. The apparatus designed by Dr. Flagg for heating gutta-percha over water and keeping the instruments hot at the same time will be found well worth the money it costs. An oil pad should be kept at hand to oil the points of the instruments so as to prevent the adhesion of material. This will be found especially useful to prevent the dragging by burnishers.

Where the labial or lingual walls of enamel are broken, so that considerable notches occur in them, exposing the filling material to friction, zinc oxyphosphate cement will be found better and more lasting than gutta-percha. Care should be taken in preparing the cavity so as to leave as much of the enamel margin as is sound and resistant. A cement of well known integrity should be chosen, and it should be well mixed and introduced into a dry cavity (the rubber-dam having been previously adjusted), time should be allowed for it to set awhile before exposing it to the action of the fluids of the mouth. We doubt the propriety of subjecting zinc phosphate fillings to the heat of instruments for melting waxes and resins upon their surfaces, and when this is done the filling should first have time to set well. A comparison of cases leads us to think we have obtained probably better results without the wax.

The next question to decide is, when shall the teeth be filled with gold? Several considerations will enter into this decision—First, how is the temporary filling lasting? If it is standing well and maintaining its color and integrity it should not be removed, no matter whether it is cement or gutta-percha. Many a called temporary filling proves to be more permanent than the called permanent fillings. Dr. Flagg has called attention to the fact that failures in gold fillings are always accompanied by extension of the cavities, but such is seldom or never the case with cement or gutta-

percha fillings. We may have a wasting or disintegration of these plastics, but the cavity is left the same size as before. We should not dare risk the employment of gold until such time as the teeth shall have completed their growth, the dentin has become dense, and the mouth is in a thoroughly hygienic condition.

From an experience and close observation of thirty years we have come to the firm belief that in the majority of normally placed teeth it is good practice to cut away a portion of the lingual wall of enamel, leaving a self-cleansing space, and we can deduce some very convincing arguments for this practice. Where sufficient separation is obtained by wedging to place these fillings without cutting away any of the lingual wall, after removal of the wedges the flat surfaces of the fillings come together in such manner as to retain particles of food which undergo fermentation and decay quickly recurs. The lingual enamel is much thinner than the labial plate, and besides being thinner is corrugated and very prone to cleave along the lines of corrugation, so that when cavities are large, leaving these inner plates of enamel unsupported, if they do not crumble under the force necessary to condense the filling, they are sure to split away in sufficient quantity shortly afterward to furnish roughened edges that afford lodgement for fermenting substances, and extension of the cavities is the result. When the lingual borders are cut back somewhat, as described by Dr. Robert Arthur some years ago in his little book on "The Treatment and Prevention of Decay upon the Proximate Surfaces of the Teeth," a permanent separation is maintained and no opportunity is offered for the lodgement of harmful substances. A self-cleansing space is maintained, and a comparison between this and the above described operation will show a result overwhelmingly in favor of the latter method. I have several patients whose front teeth I filled in this manner twenty-five to thirty years ago, and the fillings are as good as upon the day of their insertion. Furthermore, I have had abundant opportunity to observe this durability in similar work at the hands of older operators. It sometimes seems a pity we did not all abide by our first teaching—permanent separation and filling from the lingual side of the teeth with non-cohesive gold—for much of the modern cohesive gold work is far inferior. Fillings of cohesive gold placed at the knuckles of these teeth, first obtaining wide separation and then letting the teeth fall back into place, allowing

enamel margin to meet enamel margin, seldom last as long as five years, and I have seen the cavities extending in six months. The plan of cutting away the lingual enamel entirely, and building all back with cohesive gold may be a little better, but I have seen many sudden failures following such work.

Returning to cavity preparation, we would emphasize and repeat the statement that easy access is obtained by this cutting away of the lingual wall of enamel. The natural convexity of the labial plate will give an anterior retention, besides which little more than straight lines will be needed for other parts of the cavity, but to facilitate the placing of the gold and to ensure its retention there can be no objection to a slight groove along the gingival margin. The nicest care should be given to enamel margins, and here the magnifying lens should be brought into frequent use to see if perfectly smooth margins are being obtained. Just here we cannot refrain from entering our protest against the practice of drilling small pits into these cavities for anchorage—the so-called pot-leg anchor. These are always a menace to the pulp, are tedious and difficult to fill, are unreliable and insecure, it is impossible to know that you have filled them perfectly, and when imperfectly filled they are always a starting-point for new decay. They are unnecessary even when only cohesive gold is to be used, as quicker and more secure anchorage can be obtained by cutting a slight groove with hoe or bur along the gingival margin, slight convexity will be left under the curving labial plate, and all other walls may be left straight or nearly so. There is no reasonable objection to a very slight undercut at the incisive angle. These are sufficient, safe and easily filled.

We should like to make an argument here in favor of noncohesive gold for all simple cavities between these teeth, instead of cohesive. We prefer the preparations of noncohesive gold that are supposed to have that property imparted to them by the deposition of some foreign substance upon the surface, notably the foil made by Abbey. This we believe to be especially indicated in the case of young subjects, and in all cases where the pulps manifest extreme irritability. We believe it to possess a lower power for conducting heat and electricity than the strictly cohesive gold, probably because the interposition of a film of foreign matter between its leaves breaks the continuity. We employ semi-cohesive gold in all cases where

cavities have become so extensive as to require the addition of cohesive gold to their surfaces for the restoration of contour. In cases involving loss of portions of the labial or lingual plate of enamel, or compound cavities extending to two or more surfaces, we may combine foil with pellets or cylinders of strictly cohesive gold.

Discussion. *Dr. T. P. Hinman*, Atlanta: I have always used cement for the front teeth of children but have not obtained so good results as Dr. Noel claims for gutta-percha. I occasionally have a patient whose mouth contains perfect fillings of soft foil put in thirty or forty years before, and I doubt whether many of the cohesive gold fillings inserted to-day will last so long. The use of the mallet force in dentistry has reached its maximum, and from now on will probably decrease, giving way to hand pressure, and work will be better because of it.

Dr. H. E. Beach, Clarksville, Tenn.: I use tin in the case of young persons whose teeth decay before the dentin has reached its normal hardness, and I have never observed the discoloration of the gums referred to by Dr. Noel. If tin will preserve these teeth that are in the formative stage until nature has hardened the tooth substance so that they can be safely filled with gold, it should be used even if the gums are slightly discolored in rare instances by it. I have patients whose anterior teeth when forming I filled twenty-five years ago with tin, afterwards replacing it with gold, and those teeth are well preserved to-day. I have seen fillings of tin on the lingual surfaces that are intact after thirty years of service. Even in using gold I place a mat of tin foil against the cervical wall of the cavity, believing that it has a therapeutical effect in contact with dentin, helping to preserve the tooth from a recurrence of decay. Gutta-percha has not the durability of tin, but when properly used is better than any other plastic filling for children's teeth. Cements are not impervious to the fluids of the mouth, and are readily acted upon when the saliva is alkaline.

Dr. J. Y. Crawford, Nashville: I do not agree that no permanent fillings should be made until the age of sixteen is passed. I would speak a word about the necessity for regularity of the teeth. In almost every case where an incisor in the lower jaw is out of place there is a corresponding displacement in the upper jaw. All misplaced teeth should be put in position before they are filled, as otherwise it is impossible to properly prepare cavity and insert filling.

Dr. J. P. Corley, Greensboro, Ala.: I believe in permanently separating the anterior teeth so that they will not be affected by caries again. Where the proximal corners of incisors are broken down I make a separation and partial contour instead of restoring the contour. I should prefer to cut the teeth slightly apart rather than to see gold fillings in the front of the mouth.

Dr. H. W. Morgan, Nashville: I am much surprised to learn that gutta-percha is impervious to the fluids of the mouth, also that fillings of same can be so easily inserted. In fact, I cannot agree with these statements. Gutta-percha contains oxid of zinc, and I have never removed a gutta-percha filling which did not prove by its odor that it was leaky. I favor the insertion of approximal fillings between incisors, by cutting away the labial plate, and I then do not restore the contour, but give the filling a dull surface by the use of cuttle-fish strips. I use rubber for separating teeth, and believe that those who condemn it do not know how to use it properly. It should not be left between the teeth twenty-four hours, but only six or eight, as this will give all the separation necessary, and gutta-percha will then keep the teeth apart until all soreness has subsided. Two days later they will be in fine condition to be filled. Pigmentation of the gum tissue found with tin fillings is probably due to particles of disks which have penetrated the edge of the gum when the fillings were being inserted, and if they were washed out there would be no discoloration.

Dr. W. E. Walker, Pass Christian, Miss.: As I understand it, Dr. Noel advocates only the removal of the linguo-approximal marginal ridge, which has the effect of increasing or widening the lingual embrasure, thus decreasing the labio-lingual diameter of the middle and cervical thirds of the approximal surfaces without reducing the thickness of the occlusal third and especially not disturbing the natural points of contact. This does not differ from the Arthur system, except that it is limited to the upper incisors. In this location I have used it with marked satisfaction and invariably beneficial results, each year increasing my confidence in it. The only objection to it is the amount of time required to properly shape and polish. The cavity should always first be excavated, so as to leave no doubt as to its limited depth, provided there is objection to this shape, were a filling still to be inserted, though there would be no valid objection to thus shaping the surface and then

filling the cavity, as the liability to recurrent caries at the margin of the filling on a surface shaped as described is greatly reduced, owing to the greater facility with which the surface can be kept polished. It thus partakes partly of the nature of a lingual surface. Dr. Corley asks if I ever cut away this lingual embrasure without touching up the point of contact, and I would say yes, and if the knuckle needs polishing it can be done, but it is not at all part of the operation.

Dr. Noel, closing discussion: I have been somewhat misunderstood, as I should conserve the labial plate of enamel as much as possible in every case. Further, my operation refers only to the superior incisors, as the lower ones are not so liable to decay on their approximal surfaces, and as they are smaller, with contact points close to the cutting edges, they are more easily reached from the front when it is necessary to fill on the approximal surfaces.

INFLAMMATORY PHENOMENA DUE TO AN UNERUPTED THIRD MOLAR.

BY J. P. CORLEY, D.D.S., GREENSBORO, ALA. READ BEFORE SOUTHERN BRANCH NATIONAL DENTAL ASSOCIATION, AT NASHVILLE, JULY 29-31, 1901.

A woman, fifty-three years old, presented for treatment and gave the following history—Three months previous she had felt pain in the region of the right mandible, which grew steadily worse for several days until it became constant and severe, involving the entire side of the face, head and neck. The affected area soon began to swell, and the edema became so exaggerated that the head could not be moved and the eye on that side was closed. The patient was prostrated, and her temperature rose to 104 degrees. The attending physician, realizing the obscure nature of the case, called in a rhinologist, who, after an examination, stated that the post-nasal, antral and auricular regions were in a perfectly normal condition. A dentist next examined the case, and from the subjective symptoms he suspected an unerupted third molar. An examination, however, revealed no clue to such fact. The extreme swelling, inducing partial ankylosis, made examination unsatisfactory. The patient's condition grew alarming, as she became unconscious and remained so for four or five days.

The surgeon who was in consultation made a free incision through the masseter muscle at a point opposite the maxillary tuberosity.

There was a free discharge of congested blood, but it gave no relief. Then the dentist made an incision on the inside of the mouth in the internal angle of the ramus, but without result. After this the surgeon made the external opening deeper, and there was a liberal discharge of pus. Then the patient began to improve, and after a few weeks had sufficiently regained her strength to make a trip to Sewanee. Her physician there kept the incision open with drainage, and made daily injections of peroxid of hydrogen. Whenever this was not done the swelling and pain would return. A surgeon from Nashville was consulted and made some explorations with a bistoury, but found nothing except a hard substance which he took to be necrosed bone. He made a free opening into the mouth well back on the border of the alveolar process, and injected peroxid into the internal opening also. All efforts, however, to divert the pus from the external incision were futile. The physician in charge, who is one of the most scientific men in the profession, came to the conclusion that a third molar must be at the bottom of the trouble, so he brought the patient to me.

Upon examination I found that the mouth contained a full upper denture and the six lower anterior teeth, the rest of the lower teeth having been lost for a number of years. The mass of connective tissue which had formed in the buccal region prevented the mouth from opening to its normal extent, but I found the sinus which the surgeon's bistoury had made and which had been repeatedly opened for the purpose of injecting peroxid. I introduced a probe and some distance from the surface struck something which gave the characteristic feel of enamel. I therefore enlarged the opening and packed with a cotton tampon. An examination of the extra-facial fistula revealed the presence of a number of fistulous tracts radiating in several directions. It was necessary to follow the peroxid injections with a blunt probe to allow the free escape of the effervescing discharge. I kept up the tampon dilations, together with a little cutting away of the tissues, until the anterior buccal cusp of the tooth came into view. I was then able to outline its crown and found that its position was upward, inward and backward, instead of forward, as is usually the case. The patient had been under a tremendous strain for three months, and in consequence was extremely nervous and hysterical, which made the work trying to both patient and operator. Cocain was used freely, but owing to

the abnormal condition of the tissues its effect was limited and unsatisfactory. An application of nitrate of silver was made after each operation.

When sufficient of the soft tissue had been removed to expose the supra-alveolar portion of the crown it was seen that only the anterior half of it was above the process. A portion of the latter was therefore cut away and an effort was made to extract the crown, but the beaks of the forceps could not grasp it sufficiently to bring much force to bear. Furthermore, the mouth could not be opened wide enough to make the application of traction in the long axis of the tooth, and for the same reason it was difficult to use a right-angle bone drill. After consultation with the surgeon I dissected out practically all of the connective tissue in the following manner—The parts were injected with cocain, artery forceps were snapped on, and the tissues were quickly enucleated. Peroxid of hydrogen was dashed in to check the hemorrhage, and the entire side of the mouth was packed with sterilized cotton. The enucleated mass presented a number of radiating sinuses.

At the next sitting I endeavored to extract the tooth, but in vain, and in a fit of desperation I locked the beaks of a pair of cow-horn forceps around the crown and pulled it off bodily on a level with the roof of the pulp chamber. The pulp had a reddish brown appearance and gave no response when a broach was introduced. There was no evidence of putrefaction in or around the tooth. The wound was again packed, and a sitting arranged for next day, at which time a right-angle drill was used to cut a slot down through the alveolar process between the labial plate of the bone and the roots of the tooth. The blade of an elevator was then introduced, and by a twist of the wrist the root was lifted out. A small, round posterior root was present and possessed a perfectly normal exterior appearance, but the anterior aspect showed a coalescence of two distinct roots with three or four canals. On the apex there was a small exostosis which was apparently the only structural abnormality. Upon probing the alveolus I gained no information, being disappointed in the search for a sinus or fistula leading out to communicate with the extra-facial fistula.

The patient made a rapid recovery, and is now, ten months after operation, perfectly well. There is a slight scar, but no depression. Removal of the mass of fibrous tissues and sinuses perhaps prevented

contraction of cicatrix. The clinical history of the case is unique and its cause obscure. I am reporting it in the hope of gaining either by discussion or through the dental journals some knowledge of its etiology.

Discussion. *Dr. J. J. Sarrazin*, New Orleans: I saw the tooth in this case, and concluded that the bulb at the end of root was not an exostosis, but most likely a serumal calculus, as the fact that the tooth was entirely surrounded by and buried in the alveolus would preclude the formation of a salivary calculus. The trouble may have been caused by this calculus. I cannot imagine why the first incision in the neighborhood of the parotid gland was made, as it could not reach the locality involved.

Dr. A. R. Melendy, Knoxville, Tenn., asked if the X-ray apparatus would not have located the unerupted tooth at once and have furnished a clue to the cause of trouble; and *Dr. T. P. Hinman*, Atlanta, replied that within three minutes the tooth could have been located with the X-ray so that the operation for its removal would have been definitely determined.

Dr. S. W. Foster, Atlanta: I long ago learned not to attempt to extract by ordinary methods an impacted third molar which was imbedded in the alveolus. My method is to cut away the alveolus over the tooth with a fissure bur, freeing the tooth, so that it can be easily lifted out.

Dr. J. E. Chace, Ocala, Fla., asked if there was any indication of uric acid diathesis in this case to account for the formation of the calculus on the root of the tooth, and *Dr. Corley* answered that there was none, either in the patient or in her family.

Dr. W. E. Walker, Pass Christian, Miss.: I would ask if any saliva came from the fistula. In surgical works the word fistula is used to describe an abnormal canal for a normal fluid while a sinus is an abnormal canal for the discharge of fluids such as pus, resulting from diseased conditions. The appearance of the calculus would determine whether it was salivary or serumal, and if the former, the saliva must have had access to the tooth.

Dr. H. E. Beach, Clarksville, Tenn. I had a case which was somewhat similar to that of Dr. Corley. A woman wearing artificial teeth came to me suffering with a pain which her physician had pronounced neuralgia arising from her state of pregnancy. I found an enlargement in the angle of the jaw, and upon lancing it

secured a copious flow of pus. I therefore diagnosed an unerupted third molar, but on account of patient's condition thought any operation should be deferred, so simply dressed the wound and dismissed her. She was all right for a time, but a few weeks later the trouble returned and the pain was so severe that it seemed best to remove the tooth at once. I therefore enlarged the incision already made and dissected away the overlying tissue, then with a fissure bur cut the process from around the tooth, uncovering it. I found it lying with its crown pointed toward the ramus of the jaw, and easily lifted it out. Dr. Corley was very fortunate as well as skillful in the treatment of his case, and I think he has asked some pertinent questions.

FRACTURE OF THE JAW—REPORT OF TWO CASES.

By H. H. JOHNSON, D.D.S., MACON, GA. READ BEFORE SOUTHERN BRANCH NATIONAL DENTAL ASSOCIATION, AT NASHVILLE, JULY 29-31, 1901.

I report these two cases with the hope of aiding some one by method and suggestion who may be called upon to treat those suffering from similar accidents. The first case was a fracture of the superior maxilla of a boy thirteen years old from a gunshot wound. The bullet entered at the end of the nose, high enough to miss the apex of the incisor teeth. It ranged in a glancing direction towards the unerupted cuspid tooth, and evidently hit it squarely, as it carried the latter through the cavity of the antrum and lodged it in the posterior wall. The boy was carried to the office of a surgeon, who made an incision in the cheek opposite the point where the bullet had been located and removed the cuspid tooth. While he was attempting to remove the bullet it in some way fell back into the deep cavity of the bone, and was not afterward located or removed, as he did not have access to an X-ray apparatus.

There was a complete fracture of all that portion of the bone containing the bicuspid and molar teeth, and it was entirely detached from the main body of the bone and had dropped down, being supported only by the soft tissues of the mouth and the muscles of the cheek. The sockets of the teeth were not much disturbed, as all the teeth were firmly rooted in the detached portion of bone, except the first bicuspid which was knocked loose and hung merely by a membranous attachment.

After the surgeon had carefully removed all the fragments of bone

from the track of the bullet I was consulted as to the possibility of saving the teeth and the piece of bone containing them. I hurried to the surgeon's office, and found the patient still under the influence of the anesthetic. After making a hurried examination, and obtaining the facts as above stated, I decided to make a splint for the teeth, but realized that it had to be done in a hurry. I therefore took an impression in modelling compound and made a model, but after obtaining the latter I found that in pressing the material into position I had slightly misplaced the broken parts. This was corrected by sawing the model at the point of fracture, fixing the displaced portion in position, and again fastening the model together. Dies and counterdies were made, and a gold splint was swedged to fit over the teeth in the arch, extending from the second molar at the point of fracture around the arch to and including the incisors, which, being strong and firm, were to act as the support for the broken and displaced part. The teeth were dried off and the appliance cemented firmly to place. I was careful to press it into the exact position on the incisors, as this was the only guide to the natural position of the fractured body of bone. To prevent the displacement of the splint by having it accidentally bitten against, a vulcanite support was constructed a little thicker than a gold splint and cemented onto the bicuspid and molars on the other side to raise the bite.

The patient was very comfortable with his splint on, and it was allowed to remain in place six and one-half weeks. At no time was there a rise in temperature of more than one degree. When the splint was removed all the broken parts were found firmly united, there was no irritation of the soft tissues of the mouth, and everything presented a perfectly normal condition.

The second case was the fracture of the outer plate of the inferior maxillary bone, including the four incisors. This plate of bone, representing one-half of the sockets of the teeth, was split off, carrying the teeth attached to it, but there was still an attachment of soft tissue. The parts were put back in place, and the broken plate of bone had a sort of dovetail and fitted so firmly into place that it was not deemed advisable to make a splint. The success of this case was very gratifying, as it healed perfectly and left no visible scar.

Discussion. *Dr. J. E. Chace*, Ocala, Fla., asked if the impression of the lower jaw had been taken to make sure of the occlusion.

Dr. Johnson replied that he had not been called until the patient had been under ether for two hours, and there was then no time for him to think, but fortunately the articulation was perfect.

IMPROVED METHOD OF APPLYING ALUMINUM LINING TO RUBBER PLATES.

BY W. T. MAGILL, D.D.S., ROCK ISLAND, ILL.

There have been several methods advocated for this purpose, but until now I have never found one which gave entirely satisfactory results. Having had almost invariable success with the following procedure, I give it to the readers of the DIGEST. Pack and flask the case as usual, wet a piece of thin cotton cloth in hot water, and place it between the cast and rubber. Have the flask and rubber warm, put the case under the screw-press for a few minutes, take out and separate flask, remove cotton cloth, and apply the liquid aluminum mixture direct to the rubber. The chief advantages of this plan are, that the lining does not penetrate the plaster, and when vulcanized it comes out bright and clean, and very little bur-nishing finishes the case.

AMPUTATION OF THE ROOTS OF TEETH TO CURE ABSCESS.

BY GORDON WHITE, D.D.S., NASHVILLE. READ BEFORE SOUTHERN BRANCH NATIONAL DENTAL ASSOCIATION, AT NASHVILLE, JULY 29-31, 1901.

I first performed this operation for a lawyer in October, 1886. The whole upper portion of the root was denuded of its pericementum, and the anterior plate of the alveolus was gone down to a narrow strip at the gum margin. I informed the gentleman that the only thing that I could do was to amputate the denuded portion, but that I had never performed the operation and had never heard of its being done. The patient consented, however, so I split the gum over the tooth and examined the root, beginning at the apex and proceeding towards the neck of the tooth until sound tissue was reached. At that point I amputated the root with a fissure bur, and with a new finishing bur polished off the end of root that was left, then packed the opening with a little sterilized gauze and treated it about four times, after which the patient left the city. I performed a similar operation in May, 1891. In both cases the teeth are in

position and doing good service to-day, as you can readily see from the models which I exhibit herewith and which show the present condition of the gums and teeth. When I performed the first operation there was nothing in dental literature describing such a procedure, so as far as I knew at the time it was entirely new.

Discussion. *Drs. J. P. Corley, H. H. Johnson, and W. E. Walker* had each performed this operation successfully in several instances and recommended it. *Dr. Johnson* had performed it in one case of a central incisor, afterwards crowning the root, and it was still doing good service. *Dr. Corley* asked *Dr. White* whether he would leave the root if a portion of it was denuded clear down to the gum. *Dr. White* replied that in his first case the distal surface of the root was denuded clear to the gum margin, but he cleaned out the pocket and treated it just as he would pyorrhea, and, as the model showed, the tooth was still in position.

Dr. H. E. Beach, Clarksville, Tenn.: In all straight-rooted teeth, when it becomes necessary to amputate part of the root, the better plan would be to remove the tooth, cut off the diseased part, fill the canal, polish the end, and replace the tooth in its socket. This could be done more quickly, with less pain to the patient, and with more certainty as to result, than the operation described by *Dr. White*. Every preparation should be made beforehand so that each step should be done antiseptically, the root should be filled with some metallic material, and a retaining appliance should be worn for a few days to hold the tooth firmly in its place.

DENTAL EDUCATION.

BY S. H. VOYLES, D.M.D., ST. LOUIS, MO. READ BEFORE THE ST. LOUIS DENTAL SOCIETY, APRIL 2, 1901.

That ever-present spirit of progress with which each human being is endowed urges us on and on towards the ever-vanishing phantom of perfection. Each difficulty surmounted, each task completed, fills us with a desire to attain the ultimate. All that we use and all that we learn in our efforts to advance may be termed our education. The little hoard of facts and fancies which each generation inherits from its predecessor is appropriated by the individual according to his industry and receptive ability, to add to if he will. That the larger number of men choose to nurse their inheritance and to enlarge it by industry is the genesis of the world's advance-

ment. The same desire to acquire and perfect along the lines of least resistance, which in human actions is the line of adaptability and environment, has led to specialization, with a better knowledge on the part of the specialist than is possessed by the average man.

The discoverers of new truths and the delvers after forgotten ones have accumulated an ever-growing mass of facts that no one man can master. Recognizing that each trade, art or science may be carried to its highest perfection by the special and exclusive efforts of its followers, governments have given peculiar privileges to special lines of action, holding that the combined and individual results will be for the good of the general public. Our own profession (for it is or should be a profession) enjoys special privileges, the grantor thereof by its agents exacting that each member shall have a minimum qualification equal to a supposed average. Owing to the fact that the dentist's education is gleaned from so many of the trades, arts and sciences, his classification is difficult and unsatisfactory.

The ever-growing demands on our knowledge and skill call for constantly increasing teaching facilities in our dental colleges, but the earnest practitioner will always find his college training deficient, since his must be the shop wherein new ideas are molded into imperishable truths. Dr. W. A. Evans has aptly said, "The time is quite recent when the demand in the smaller towns was for a dentist—not necessarily a good dentist. The community needed dental help; there were large stretches of country without a dentist, and there was therefore a call for one. No matter what his ability, there was a reward for a man who knew more about teeth than did the average citizen in the town. That time, however, has passed, and the reward is for the good dentist, so educated that he may continue to develop."

While we are all united in that we must be better educated, we are divided as to which one or more special lines of study should be extended. First are those men who hold that we should all be doctors of medicine, with a special post-graduate course in dentistry. Second come those who hold that "theory" is given too much attention, and that we should rather be more finished artisans. There is a third class, in which your essayist begs to be included, which believes we should be and are a distinct profession, numbering each man as skilled in hand and mind.

The course of life is through a jungle of intervening struggles, rising hopes and crushed ambitions, and each man must hew his own pathway, plucking from each tree of knowledge that which may sustain and aid him to good achievement. No science or profession has an exclusive right to the knowledge that is general to it, as applied to a distinct and separate one. Because we apply to our work much that is included in the education of the physician and surgeon is no reason why we should be graduates in medicine. That we use some of the methods of the molder and of the sculptor is no sign that we should be members of the molders' union or graduates of an art school. Concentration is the germ of progress, and I believe that we should appropriate more of medical knowledge than we have in the past, but to take all would be a dangerous division of effort. Experience has taught that the average man can best attain manual dexterity, which is an absolute essential to a successful dentist, during the few years about maturity. Financial necessity decrees that he must compress his preliminary mental education into the same short period. How best to harmonize the two, that each shall be sufficient, is the problem confronting us.

Every operation on living animal tissue should be for supplying lost tissue or improving impaired function, and to be successful it must be performed with a full knowledge of the laws governing animal life, and of the cause of the imperfection and the best known remedy therefor. In times past, and let us hope forever past, the dentist confined his operations to the hardest tissue in the animal body, and one per se practically unchangeable. In our present enlarged and growing field of action, however, we must be prepared to aid in the rejuvenation of practically all tissues. Let us not feel that because our field is limited as measured in inches and our mistakes are seldom fatal we do not need a comprehensive and profound knowledge of the entire physical system. That wonderful process of assimilation of dead food into living tissue, and from that into dead waste, is as marvelous and as constant in the dental pulp as in the muscle or softer brain tissue. That grim struggle within our bodies between the white corpuscles and the invading microorganisms should be as interesting as a war of nations. It is waged more relentlessly—no laws of civilized warfare, no red cross for the wounded, and no white flag for the conquered—nothing but extermination, and it may be of you or of me.

It is not a necessity for the dentist to know the symptoms, etiology and treatment of all the diseases of the organs and tissues of the body, but he should know most thoroughly the physiology of the body and perhaps less thoroughly its anatomy. He should know much of pathology and chemistry, but he need not take either in such detail as must the medical student. The general laws should be most thoroughly inculcated, and in later years he may add to the knowledge which other duties compelled him to abridge in his college training. It is given but to the master minds to grasp the sum total of human knowledge and to use each and every portion in the accomplishment of great deeds. The man of medium mold must concentrate his aims and his efforts. Growth can take place only after assimilation. There is only one histology and one pathology, but each is a great study in itself. The student with average mind and time, who wades through the whole course of these studies without the training and the experience necessary to know and extract that which is needful and helpful to his future special work, is apt to come out with his vision dimmed and his mind spattered with the overabundance of knowledge. In these branches of science the facts not necessary for the dental student should be sifted out, and the remaining and helpful ones should be so arranged that they could be readily grasped and understood by him. With this as a foundation the practitioner could build up his knowledge as his needs and desires might dictate.

Empiricism has been the weight about the neck of dentistry. The history of folk-lore and legends, as handed down from generation to generation by word of mouth and crude drawings, is very like that of dentistry. We have been too prone to follow in the footsteps of the honored ones without knowing why or where we were going. Effects have been ascribed to wrong causes, and great results have been too often mere literary delusions. Our literature has been vague and almost exclusively deductive, and the dental profession has been about the last to adopt the Baconian idea of scientific research. Much of our literature has been founded upon the work of skilled mechanics who were without the mental qualifications for true reasoning. We have promulgated laws of procedure without a sufficient number of preliminary truths upon which to base such laws. Nevertheless, no one conversant with dentistry as it is to-day and as it was yesterday should feel discouraged.

Great deeds have been accomplished, although they but emphasized our imperfections and showed still greater tasks before us. Every man, be he ever so humble, is a teacher—no individual is without some influence on someone else—yet good teachers are as rare as poets, of whom it has been said that "The receipt for making is in the safekeeping of nature and the foreordaining stars."

Our dental colleges are passing or have just passed through the changes of supply and demand through which the profession has passed. The time was when the field was new and the demand was for a college—not necessarily a good college—and teachers were selected exclusively from stockholders and inexperienced graduates, regardless of their ability as teachers. A good dentist is not always a good teacher. We all do many things intuitively—a case where the subjective mind usurps the motive power of the objective—but the teacher is he who can trace each idea to its home and call it forth at will to obey his commands. As the demand for dental colleges has been supplied, so the need for improved colleges will be met, and those at the head will put forth efforts to secure good teachers, which demand will be met by studious, thinking, practitioners—men who can realize and understand the lack of knowledge of those to be taught, and who can show understandingly the value and practical bearing of all things taught. Without such aid the student in his ignorance would not appreciate until too late.

The laying out of an ideal dental curriculum requires a grasp of and a judicious selection from as broad a field as in any calling known. With the appreciation of this fact by a larger per cent of our profession, the schools affiliated with state institutions and the larger universities will be prepared to offer and enforce a fuller and much better selected course of study, and the smaller schools then must follow suit.

The work of a few great men during the last decade in subjecting old and established procedures to the flame of scientific investigation has led to a recasting of opinions and is the rift in the clouds through which we see the rising sun of dental science. We have advanced and grown in the past by hard work and grim determination, even though our methods were crude. Now that we know how to work, how to experiment, and how to join cause and effect, we can uprear our heads among scientific men and be well worthy of our place. Given a good preliminary education, teach the dentist the beauty of

nature's great manifestations and how to use them, and he will start in life with a solid foundation and a desire to broaden himself in all directions, and will be a man among men, a gentleman, a scholar and honored in his sphere.

PROSTHETIC DENTISTRY.

BY A. G. ROSE, D.D.S., CINCINNATI. READ BEFORE THE CINCINNATI ODONTOLOGICAL SOCIETY, FEB 22, 1901.

What can we look forward to in prosthetic dentistry for the coming century? The abandonment of the present form of dentures is not likely, and nothing but continued and persistent effort on the part of the dentist in saving the natural teeth can stay the demand for the artificial ones. We celebrate today the birthday of the greatest American—George Washington. His artificial teeth, carved out of one solid piece of ivory for the upper and one for the lower set, the two being held together by means of a spring, are one of the noted relics of this country. Artificial teeth made from porcelain were doubtless unknown and perhaps not thought of in his day.

In this connection I would state that nothing is harder for this generation to understand than the changes in the condition of man which have come about in the last hundred years. The average American mechanic of today is in many respects better circumstanced than was any king of a century ago. He eats more wholesome food, has more conveniences, derives more satisfaction from living, when sick has the benefit of medical and surgical science that was then unknown, he knows facts of nature and science not dreamed of in 1801, also how these facts may be used to most advantage, he is likely to live longer and is certain to live better.

At that day dentistry had not come into existence. Barbers pulled teeth on occasion just as they let blood, and the only remedy for an aching molar was to have some one drag it from the jaw. The principal dental instrument was the key, a contrivance which inspired a dread upon sight. With this the tooth was loosened, and lucky indeed was the victim if three or four were not pushed out before the offending member was reached. Artificial teeth were carved from ivory, as per the description of Washington's set, and in order to use such plates it was necessary to have all the natural teeth extracted. Contrast this cumbrous piece of mechanism with the denture made today. The great work accomplished along the lines

of operative dentistry in the care and saving of the natural teeth has taken largely from the necessity for artificial ones. If the dental profession were to cease for even a short period of time its operative procedures the demand for artificial teeth and plates would be enormous.

Prosthetic dentistry has called to its service materials from the mineral and vegetable kingdoms. The denture most dear to the artistic eye, continuous gum, has been carried to a high degree of art, and even perfection, but it lacks the requisite strength. One of the most beautiful dentures ever made by the profession was called "rose pearl," and was composed entirely of porcelain. The lack of strength is no doubt the reason, rather than the difficulties attending the construction, why these porcelain dentures have fallen into disuse. However, there is always a demand by the public and a desire on the part of the dentist to reproduce the natural tooth structure in appearance, as witness the work going forward in porcelain inlays, crowns and bridges, the reproduction of natural forms in gum teeth, etc.

In former years the dentist prepared his materials for making teeth, ground his kaolin, silex and feldspar, made his molds, carved the blocks, and while producing a heavier set of teeth he certainly obtained a denser porcelain, one bearing the subsequent firing and grinding better than the porcelain teeth sent out by the manufacturer of today. Recognizing the delicate nature of the manipulations, and the long experience necessary to attain to any considerable degree of excellence in the various processes connected with their manufacture, I still hope for greater improvement in the teeth. They should not so readily pull away from their fastenings or break so easily while a denture is being constructed. Dr. Kingsley states that all porcelain which is used in the manufacture of teeth in this country is porous to a certain extent. This may be tested by exposing them to a higher heat than that at which they were fused, and you will then see how much smaller they become and how much more dense. The material has not been lost, but has been condensed. A little heat more or less changes both shape and color, which gives the enormous variety now available. The English teeth are more dense than the American ones, and there is not so much shrinkage to them. Our manufacturers should endeavor to overcome this defect.

Discussion. *Dr. F. A. Hunter:* The essayist made one misstatement, as "rose pearl" was not porcelain but vegetable in its composition, belonging to the celluloid class. I wish to speak of the use of clasps for partial plates, where one, two or a dozen teeth are to be supplied. The practice ordinarily observed of fitting a broad clasp around the remaining tooth or teeth inevitably results in injury to same. This, combined with the method of making the plate hug the necks of the teeth as closely as possible, is a most reprehensible practice. Plates should be trimmed away so as not to touch the teeth, and a band or clasp should fit the broadest part of the tooth, away from the gum, so that when the plate comes to imbed itself somewhat in the tissues the clasp will not bury itself in the gum and cause lasting irritation. Some time ago I made for my own mouth a partial plate which is provided with a standard and a lug extending over the end of the teeth in such manner as to prevent the plate from burying itself in the gum tissue. In order to obtain space for such a lug I frequently grind into a fissure on the occlusal surface of a bicuspid, so that there will be no interference with the articulation of the teeth.

Dr. Grant Molyneaux: Many dentists seem to have no appreciation of the practical requirements of a clasp. More harm than good may result from using a metal which is not sufficiently elastic. It is a nice point of adjustment to have the clasp thin enough that it will spring over the bulbous part of the tooth, embrace it with perfect accuracy at a point where it will neither slip up or down, and be strong enough to endure. The teaching that platinum should enter into the composition of the clasp coming directly in contact with the tooth, in order to prevent decay, is wholly erroneous. I affirm that platinum aggravates decay if anything. It is electro-positive in its relation to the tooth, which must suffer if there be any tendency towards galvanic action. A gold clasp is not so favorable to the destruction of tooth substance. It often becomes discolored and then all electrolytic action ceases, as a condition of polarity exists. It is contrary to accepted theory to place an amalgam filling where it will come in contact with a metal clasp, but I believe such procedure is the very thing to insure against the destructive action of electrolysis. The mercury in the amalgam will form an oxid on the clasp which precludes the likelihood of further galvanic action. In applying nitrate of silver to the necks of sensitive teeth I

have noticed that if there is an amalgam filling in proximity a very black oxid will be deposited on the surface of the tooth. Regarding that as a positive advantage, I sometimes use old scraps of amalgam, except those containing copper, in combination with nitrate of silver when making an application to sensitive spots on teeth, and it wears a long time.

Dr. O. N. Heise: I would deprecate the practice carried out by so many of fitting clasps to the plaster teeth of the model, as they cannot be properly fitted in that way, any more than a regulating appliance can be. Dr. Molyneaux claims that we can fit the clasps to a metal model with perfect accuracy, but I maintain that clasps should be fitted to the teeth in the mouth. I regard Dr. Molyneaux's claim, that nitrate of silver in the presence of a metal clasp stops electrolytic action, as mere theory. I have built up badly broken down teeth with amalgam and covered them with a shell gold crown, and they have been lost through electrolysis. Again, I think platinum is the best material for clasps, provided a good adaptation to the tooth is secured, as it is more kindly accepted by the gum tissue than is gold. We look everywhere to find some explanation of decay and of electrolytic action, when after all the matter is simply and solely a failure to thoroughly adapt the metals, especially as regards fillings. I do not believe that copper amalgam has any therapeutic effect on dentin or that it renders the teeth impervious to decay. Gold will accomplish more than any amalgam if sufficient pains are taken with it.

Dr. Molyneaux: Dr. Heise has made an extreme application of my statement, which was offered as a suggestion for ameliorating distressing conditions pending the opportunity to do something better. The case he cites of a tooth built up with amalgam and crowned with gold is not to the point. There we have all the conditions for a dry cell, and consequent electrolytic action. I spoke of cases where all the parts are exposed to the fluids of the mouth and where the oxidization of one of the poles of a battery must inevitably result in the cessation of galvanic action.

Dr. Frank W. Sage: When I was a dental student it was the fashion to decry mechanical dentistry. Rubber-dam had just been introduced and the profession was going crazy over contouring with cohesive gold. The introduction of vulcanite a few years before had created a feeling in the profession that mechanical dentistry

was unworthy of serious consideration. The word "nasty" was applied to express an unreasoning antipathy against rubber, which had robbed the dentist of an important source of income. The fact that some one must provide plates for the dentist's patients could not be altogether evaded, but the sentiment was that any fourteen year old boy could learn in a few weeks "to boil rubber." About this time "fine" operators began to loom up, men who did nothing but fill teeth and who announced with pride that they had given up forever the making of plates. What wonder was it then that we students regarded mechanical dentistry as something which had been unwarrantably foisted upon the profession, and that in the dental colleges the mechanical branch actually fell into disrepute. However, as time went on I for one began to suspect that mechanical dentistry was not wholly unworthy, and now after long years I have a positive conviction that the dentist who expects to fulfill the reasonable requirements of his patrons must pay considerable attention to prosthetic dentistry. Indeed, in order to succeed in this branch of practice one needs to combine with a fine manual training, the utmost judgment and discrimination, quite apart from the mere operator's knowledge. I have been surprised to discover the lack of color sense shown by some of our best men in their selection of artificial teeth. The habit of observation and learning therefrom is lacking in many persons to an astonishing degree. For instance, a dentist may spend hours in the endeavor to match a natural tooth or teeth, when if he were a close observer he would perceive that the match was not the thing required at all. Let him place his patient across the room and try first this tooth and then that, and it may dawn upon him that the desired result is not a question of matching an individual tooth but a general effect.

Dr. E. J. Waye: I understood Dr. Rose to say that in order to insert an artificial plate and teeth carved from ivory all the natural teeth must first have been extracted, but I have seen an ivory set which supplied only the bicuspid and incisors.

CROWN WORK.

BY H. H. JOHNSON, D D.S., MACON, GA. READ BEFORE SOUTHERN BRANCH NATIONAL DENTAL ASSOCIATION, AT NASHVILLE, JULY 29-31, 1901.

There are so many systems of crown work that at first thought it would seem almost superfluous to add another, but when we remem-

ber that we have not in all the number what might be termed an ideal bicuspid crown, we feel justified in attempting an improvement. The Richmond bicuspid crown is strong and durable when well made, but has the objectional feature of a great display of gold about the occlusal surface, furthermore the facing is liable to be checked in soldering.

With the consent of Dr. J. Y. Crawford I herewith present one which should rightfully be termed the Crawford crown, and it will be found to be almost if not quite the ideal crown. Dr. Crawford has worked it up by embodying some of the old Richmond ideas with original ones of his own. It is made as follows—The root is prepared by grinding it off about even with the free margin of the gum, avoiding any oval or round shape at the end and removing any bulging shape at the sides. The canals are then enlarged for the reception of platinum posts, not forgetting to ream out with a large bur the orifices into a counter-sink. A band is carefully fitted about the circumference of the root, to which a flat top is soldered, forming a cap. This flat top is placed on the root and burnished down into the counter-sunk orifices of the pin holes. The holes for the pins are now punched at the indicated spots, the pins placed in position, the whole removed and the pins soldered in place from the upper side, filling the counter-sunk holes about the pins flush with solder. The cap and pins united are now placed back on the root and a bite and impression taken, from which an articulating model is made and mounted in an articulator.

The gold cap is now on the model which represents the mouth, and the pins are left projecting above the surface of the cap. Grind these off even with the top of the cap. The tooth is now selected, and it must be a vulcanite bicuspid. Adjust this to a proper occlusion by grinding off perfectly flat at the base, allowing it to fit flat against the top of the gold cap. Now with a strip of thick tinfoil take a measure of the circumference of the bicuspid tooth and make a gold band deep enough to reach to the grinding edge on the palatal side. Trim the band down to a narrow strip on the buccal side, press the tooth into this band and burnish the edges to a perfect adjustment. While the tooth is still inside it, grind or file off the base of the band flat and even with the base of the tooth. Remove the tooth and place the band, narrow edge front, on the gold cap and solder together with a minimum amount

of solder. If the band fails to fill out to a proper contour on the the palatal side, this deficiency may be remedied by thickening with solder at that point. After polishing the cap and band, the crown is completed by cementing the porcelain bicuspid firmly into place in the half cup which was soldered to the root cap. When this has been allowed to set hard out of the mouth it is ready to be cemented onto the root in the mouth and the job is completed.

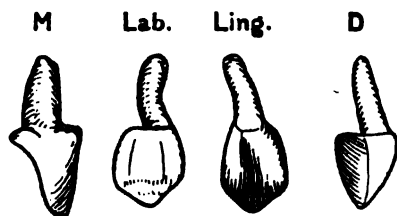
We now have a very strong, natural looking crown, with a proper occlusion and showing a minimum amount of gold. The final result of the work is never in doubt from the beginning, as the porcelain tooth never goes into the fire and there is no checking or other failure. This description of the method may appear somewhat voluminous, but it should not deter anyone from attempting to use it, as in practice it will be found not to take longer than the making of a Richmond crown, and in many ways it is more satisfactory.

NORMAL SOLUTIONS.—A normal solution of any substance is a solution in which that substance exists in the proportion of its molecular weight in 1,000 parts of water. Sodium hydroxid, NaHO , for instance, has the molecular weight of 40, hence a normal solution of the substance contains 40 parts sodium hydroxid in 1,000 parts of distilled water. A centinormal solution contains one one-hundredth, and a decinormal one-tenth of that amount —*Ex.*

EMPHYEMA OF CAVITIES OF FACE.—By P. Braunschweig (*Muench. Med. Woch.*) The commonest cause of the inflammation of the accessory cavities of the face is catarrh of the nose, or, in fact, any suppurative disease of the nasal cavity. In cases of disease of the frontal sinus with perforation into the orbit, the eye may be extensively dislocated without much alteration in its visual powers. Occasionally the cornea or the anterior portion of the eye, as a result of pressure and exposure to purulent secretion, becomes ulcerated. The following case shows the method of treatment in this condition. A man of 32 developed a swelling in the upper internal angle of the right eye, which was incised, and from which a considerable amount of pus was evacuated. Two years later the swelling again appeared, and was diagnosed as dropsy of the right frontal sinus. This was relieved by puncture, but nine years later, after a severe cold, the swelling suddenly reappeared and was accompanied by extreme pain. Pressure produced purulent discharge into the throat and nose. There was some dislocation of the right eye. Incision was therefore made down to the upper edge of the orbit, the frontal sinus opened with a chisel, and the bone was found to be very thin and soft. The sinus was found to be filled with thick homogenous pus. The opening was then enlarged, the sinus washed and curetted, the ethmoidal sinuses thoroughly cleared out, a drain inserted, and the wound closed. It healed uneventfully and produced almost imperceptible deformity.

Digests.

ABNORMAL ERUPTION. By Dencer Whittles, B.D.S., L.D.S., Eng. The patient, A. B., a girl aged 10, was sent to me at the General Hospital for treatment. The earlier history of the case is as follows: When six years old acute periodontitis set in in the region of the right lower incisors and cuspid of the temporary teeth. The chin was constantly poulticed on the recommendation of a general practitioner, with the usual result that a troublesome sinus was made, whereupon he advised that the child should be taken to the Dental Hospital, where five temporary teeth were



Length from tip to apex, $\frac{7}{10}$ inch; greatest width, $\frac{3}{10}$ inch.

$\frac{3}{20}$



Looking at tooth from above downwards.

extracted. Six months later a sequestrum came away through the external sinus, which now healed, leaving a depressed scar through which the inferior cuspid has erupted. Before deciding to extract I thought it advisable that a radiograph should be taken in case the root should be a hooked one. It proved to be a straight one, and consequently there was no difficulty in the operation. The accompanying sketches of the tooth will explain what probably happened. These are made as the tooth appeared on the chin, but their respective mesial and distal sides are drawn as they would be placed had the tooth erupted in the buccal cavity. I was informed that the patient gave the chin tooth a bump on one occasion, which caused the first bicuspid to rise, but it righted itself again. The tooth sac evidently turned a somersault forwards, as the lingual aspect was forwards, so that the dentinal papilla was to an extent strangulated,

hence the loss of $\frac{3}{8}$ in. continuity of the root with the crown on the actual labial surface. This evidently happened just after the crown was completed. The wound healed rapidly and skinned over in five days—*Jour. Brit. D. Assn., Dec., 1901.*

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HYPERTROPHY OF THE GUMS—CONTINUED. Including Surgical Treatment of Case No. 2, reported in DENTAL DIGEST, June, 1901, p. 426. By W. J. Roe, M.D., D.D.S., Philadelphia. Read before Pennsylvania State Dental Society, July 9, 1901. *Operation July 25, 1900.*—The gums were carefully sprayed with hydrogen dioxid at intervals of two hours during the two preceding days. Ether was administered. Beginning on the right half of the mandible and at the ramus I made an incision through the mucous membrane and periosteum, extending on the labial surface to the median line, and upon the lingual surface to the cuspid tooth, and a little distance from the hypertrophied gum. With a periosteal elevator the gums were readily detached from the alveolar process, taking with it the two roots of the first molar, which were firmly held in the hypertrophied gum-tissue, leaving their sockets perfectly clean. The bone was firm, showing no evidence of involvement. The gums of the right maxilla were then removed in a similar manner, the labial incision ending in the median line and the palatal at the cuspid tooth. The second molar, which was carious, and second bicuspid, which was loose and carried downward, did not come away with the gum-tissue, but I afterward extracted them, as the alveolar process had been greatly absorbed, leaving not more than one-third of their roots covered. The same procedure was carried out upon the gums of the left superior maxilla and left half of the mandible, except that no teeth were removed. There was considerable hemorrhage, which was readily controlled by pressure with gauze sponges, and the denuded bone was dry at the termination of the operation.

About one hour later severe reactionary hemorrhage began, and the resident physician made local applications of the following agents in the order given, with but little success: hot water, solutions of alum, suprarenal extract, and Monsel's, after which he made continuous pressure by means of gauze sponges and his fingers for a considerable time, which controlled and stopped the hemorrhage. Constitutional evidence of the loss of blood was manifest in pallor,

sweating, and compressible pulse, which increased to 140. On July 28 the patient was discharged from the hospital, not having had any pain since the operation, the wound surface being in excellent condition and covered with healthy granulation.

Examination of Tissue Removed at the Operation.—The first portion of the hypertrophied gum removed was immediately incised, and spreads were made from the freshly cut surfaces; inoculations were made from these surfaces upon agar-agar and bouillon, also pieces of the tissue were macerated in bouillon. The cover-glass spreads were stained by Weigert's method. Microscopical examination revealed numerous yeast-cells. The cultures failed to reveal the growth of the yeast fungus, but showed various bacteria commonly found in the oral cavity. Pieces of the tissue from the various portions were fixed and sections were prepared as described in previous report.

Histological Examination.—One surface is covered with a layer of squamous epithelial cells, which were apparently normal. The opposite surface is composed of a dense layer of fibrous connective tissue, which apparently is the periosteum. The structure between the epithelial layer and the periosteum is composed of fibrous connective tissue and comprises at least four-fifths of the entire section. This layer corresponds to the second layer described in the previous report, but cannot be divided into two parts as was that layer, since the fibrous tissue is uniform in density throughout and contains fewer cells than the second layer in the previous report. This specimen differs from the one previously examined as follows: There is a marked increase in the quantity and density of the fibrous tissue, and a great diminution of the number of cells, which is probably due to a transformation of the various cells in the first specimen into fibrous tissue.

Results of Operation, and Condition of Patient to Date.—For the following five months I saw the patient once each week. The reformation of the gums in the molar and bicuspid regions was apparently perfectly normal, but in the region of the anterior six teeth, especially the upper, it appeared abnormally thick and slightly lobular. On Dec. 20 I removed for histological examination a piece of this gum-tissue, and Dr. Funk reported that the specimen showed practically the same histological condition as did the first specimen examined, excepting in one important particular,

i. e., the absence of yeast-cells. Since then until the present time I have observed the patient at intervals of two weeks, and the apparent thickening of the gums, instead of increasing, has slightly decreased. The absence of the yeast-cells and the cessation and slight diminution of growth argue strongly against this being a recurrence, and until positive evidence is adduced I shall not consider it as such nor institute further treatment.—*Cosmos, Oct., 1901.*

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DISINFECTION OF DENTAL INSTRUMENTS BY MEANS OF SPIRIT OF SOAP. By W. D. Miller, D.D.S., M.D., Berlin, Germany. Some ten years ago I reported upon experiments made with a number of antiseptics then in use as to their adaptability for sterilizing dental and surgical instruments. In these experiments I adopted the following method: Small cylinder-shaped pieces of glass, about 5 mm. in diameter and 4 to 8 mm. long, were put into a glass vessel containing some freshly extracted carious teeth, and a few drops of water added. They were stirred about with a glass rod until coated with infectious material, and then dried for twenty-four hours at room temperature or for two to three hours at blood temperature. A number of these objects were now laid in a sterilized glass vessel, the liquid whose antiseptic action was to be tested poured over them, and covered with a somewhat larger glass vessel, to prevent the possibility of infection from air germs during the experiment. At certain intervals one piece after another was taken out with sterilized pliers, rinsed with sterilized water and dropped into a tube of bouillon and kept in the incubator at 35 to 39 degrees C.

I purposely subjected the antiseptics to a severer test than they are likely to be put to in common practice, as I am of the opinion that our agents and methods should be sufficient not only to sterilize those instruments which have been previously thoroughly cleaned mechanically, but also instruments in which this precaution has not been taken, seeing that many operators are somewhat lax in the matter of asepsis, or occasionally even of ordinary cleanliness.

As a result of my investigations at that time I came to the conclusion that the five per cent solution of lysol was the most effective material we possess for sterilizing the hands and instruments chemically. Since that time various other remedies have been recommended for the purpose, among them formalin and spirit of soap.

The former has not been universally adopted, principally on account of its disagreeable, pungent smell and irritating effect upon the mucous membranes.

Spirit of soap, however, has been recommended by various authors since Mikulicz reported favorably upon it in 1899. As lysol has an odor which to some is unpleasant, and which is easily communicated to the atmosphere of the whole room unless particular precautions are taken, I was much pleased at the prospect of getting an antiseptic possessing all the advantages of lysol without its disagreeable odor. In order, however, to assure myself that spirit of soap is as reliable as lysol, I carried out a series of parallel tests between these two materials by the method given above. Of these tests (fifteen in all), eleven resulted in favor of lysol, one in favor of spirit of soap, and three were inconclusive. From these results I was forced to the conclusion that spirit of soap is not equally reliable with lysol, so that, while I now use it for disinfecting the hands, I still adhere to the five per cent solution of lysol for the sterilization of instruments.

As repeatedly stated in former publications, I always have two complete sets of instruments in use, and while I work with the one the other lies in the lysol solution for at least half an hour. Burs remain in it from one to four hours, although after mechanical cleansing one-half hour might be considered sufficient. I use for the purpose a plain glass vessel filled about three inches deep with the solution. Double-ended instruments I never employ, as it is impossible to sterilize them without putting the whole instrument into the solution. Nor do I use any cone-socket instruments, as infectious matter easily accumulates at the joint where the point is screwed into the handle, which necessitates the screwing off and mechanical cleaning of the point as well as the handle every time the instrument is used.

For similar reasons dental instruments should be perfectly smooth and polished, and the handles, so far as they come into contact with the mucous membrane of the mouth, should not be ornamented in any way. Particular attention must be paid to the scalers, as lesions of the gums are scarcely avoidable in using them. Consequently, in addition to the lysol treatment, as an extra precaution, just before using them I dip them into oil of cloves or concentrated carbolic acid and draw them through the alcohol flame, so

that the liquid catches fire and burns off. With smaller points one must see that not more than a minute quantity of the liquid adheres to the instrument, otherwise the temper of the latter is sure to suffer; with larger points the danger is not so great. In the same way I sterilize spoon-shaped excavators, used for clearing out cavities deep under the gums, where the soft tissues are sure to be wounded.

In all cases where infectious diseases of the mouth are present, particularly where any symptom indicates the possibility of syphilis, the instrument must be sterilized with boiling water, about two per cent of soda being added to prevent rusting. The chief objection to the general use of boiling water for sterilizing instruments lies in the fact that, notwithstanding the use of the soda, it is very difficult to keep them bright and polished.—*Cosmos*, Nov., 1901.

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BLEACHING AGENTS. By N. S. Hoff, D.D.S., Ann Arbor, Mich. Read before Tri-State Dental Meeting, Indianapolis. That a comparative study of the bleaching powers of various well-known bleaching agents on organic stains might be made, a number of old extracted teeth were selected and cleansed of all carious substances, the apical ends cut off and the pulp tissue thoroughly removed. They were then thoroughly cleansed mechanically and chemically by chlorinated soda. After washing and drying they were soaked for three days in the following solution to stain: Eucalyptol full strength solution; old and dark oil of cloves; old oil of cassia; Black's 1, 2, 3 mixture and aristol; iodized phenol; 95 per cent solution of carbolic acid; old creosote; solution of iodoform in ether; alcoholic solution of beta naphthol; a glycerin solution of tannic acid. They were then removed from the solutions and slowly dried until entirely free from excess of moisture. The result showed staining varying from old gold to almost a purple.

One tooth of each stain was then cut across the root into thin sections, leaving the crowns almost intact. A complete set of the sections was retained as a proof set or sample of each stain, and the remainder was subjected to the staining powers of the following bleaching agents: Twenty-five per cent peroxid of hydrogen; three per cent peroxid of hydrogen; saturated solution of sodium dioxiid; saturated solution of benzozone; aluminum chlorid; chlorinated lime; Kirk's sulphurous acid method. These reagents and

the methods of using them are well known except benzozone, which is a new organic peroxid and is used as a disinfectant, being considered of higher value than mercuric chlorid.

The bleaching agents used were divided into two classes—oxidizers and reducers—because of their chemical reactions. The oxidizers include all the peroxids and the reducers the chemical reagents.

The bleaching of the ten stains by the seven bleaching agents was done under as nearly similar conditions as could be made. Each set of sections was treated to the respective reagents for twenty-four hours at room temperature about 60 deg. F., and then the temperature was raised to 150 deg. and kept there for one hour. The sections were then removed from the bleaching solutions and washed thoroughly in several changes of distilled water. They were then dried in the sunshine for several days and tabulated in proper order on a card for study.

It was found that the twenty-five per cent peroxid of hydrogen was most effective in the majority of stains, bleaching all except the iodized phenol and the creosote. The sodium dioxid produced almost as profound bleaching as the peroxid, the iodized phenol stain yielding to this bleacher. None of the sections was as clear as those bleached by the peroxid of hydrogen. Benzozone stood third in effectiveness. This agent is not readily soluble in water and does not act promptly, but is more continuous as a supersaturated solution is used. This agent has much of promise, due to the fact that it is made of organic acids which will not disintegrate the hard tooth tissues, and plenty of time may safely be given for it to act. The three per cent peroxid did not decolor the stains sufficiently to make it of any special value. The aluminum chlorid was only slightly better than the three per cent peroxid of hydrogen. It seems to have acted very favorably on the iodoform and the tannic acid stains. The chlorinated lime had about the same value as the aluminum chlorid. It seemed slightly more effective in bleaching the eucalyptol and iodoform stains. Kirk's sodium sulphite and boric acid mixture was the least effective. It had no effect upon the oils, creosote or naphtha stains.

This study indicates that the bleaching of organic stains cannot be as effectively done by chemical reagents on the substitution theory as by the directly oxidizing agents. Whether this is due to nascent

oxygen set free or to oxygen in a molecular form it is difficult to determine. Practically, these conclusions indicate that effective bleaching of organic stains from medicines at least can best be done by those agents which will liberate most readily free oxygen.

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ORAL PROPHYLAXIS. By D. D. Smith, D.D.S., Philadelphia. Read before the New York Institute of Stomatology, June 4, 1901. To arrive at any adequate conception of the value of the pulp in adult life there must first be a better and clearer understanding of what constitutes *tooth-life*. And in order to have this the ordinary complex division of the tooth should be abandoned, and the tooth resolved into its natural and distinct parts, crown and root, with full recognition of its two separate and distinct sources of life and nutrition. There must also be recognition of the fact that the *root* of the tooth and not its crown is the real, vital, living anatomy. A genuine living, functional tooth can be maintained without any portion of its natural crown; but a crown, no matter how perfect it may be, is entirely valueless unless supported on a living root. It must be recognized that the pulp-life which goes alone to the crown in its entirety—to its dentin and enamel and to the dentin of the root—is entirely separate and distinct from the life of the cemental tissue of the root; and that this cemental life is supplied wholly by the pericementum and its adjuvants. The crowns of teeth may be slightly affected or largely destroyed by decay, or even entirely obliterated, without appreciable interference with the integrity, utility, or even the esthetics of the real tooth. The fact that a tooth with a living pulp and an unimpeachable crown may and often does become entirely valueless through disease in cemental and pericemental tissue fails of recognition. What shall become of a pulp, either through disease or interference, is a matter of trifling import so long as the cemental and pericemental life remains intact, *but destroy the pericemental life and you destroy the tooth.*

Again, to form a just estimate of the value of the pulp in adult life, there must be an appreciation of the influence of misdirected pulp-activity in converting the cementum of the root into denser structure, as frequently results in adult life. Cementum, that all-important tissue of the root, is thickest and most abundant and vascular in young life; and because of this the integrity of the tooth is best maintained at that period. Teeth with *dense* cemental tissue,

sparsely distributed over the roots, are found in adult life only; and this denser cemental tissue is always, we believe, on teeth with living pulps; whilst abundant and properly distributed cemental tissue, so necessary to the conservation of the tooth, is found on young teeth generally, and on teeth and roots with devitalized pulps.

Pyorrhea rarely or never begins in *young* adults; neither is it found in connection with devitalized teeth where the devitalization occurred in young life. These conditions existing, it necessarily follows that whilst through destruction of the pulp there may be inconsequent injury or damage to the crown, there is yet no interference with cemental and pericemental life and consequently no injury to the real, living, and most important part of the tooth. These phenomena and deductions, as addenda to the discussions on "the value of the pulp in adult life," are not speculative merely, but they bear important relations to one phase in particular of oral prophylaxis.

It is not my purpose to attempt to answer the question, What is tooth-decay? but we may properly consider one near of kin, but more practical, more closely identified with our interests, and altogether more important—How do teeth decay? In previous writings the author has persistently maintained that tooth-decay always has its origin from the external surface of the tooth; if in the crown of the tooth, it begins in the enamel; if the parts are devoid of enamel, it begins at the surface of the dentin. Resolving the enamel until contact with dentin is gained, it expands and proceeds along the lines of the tubules in the direction of the pulp. The progress of this process of chemical tooth-solution, which we call decay, is hindered and opposed by two conditions only, namely, the constituency and consolidation of the dentin and the vital energy, a force often scarcely appreciable, interposed through the existence of the living pulp. It would seem that if any feature of tooth-decay is reasonably well defined, *this* is that feature; and yet I notice that this society has recently discussed this very proposition; and that not seemingly with any hesitancy or doubt, but with the full assurance of a settled finality.

Were we required to enunciate the fundamental principle governing treatment in a case of surgery, we would unhesitatingly say, first look for the cause, then endeavor for its elimination. This principle is as good and as applicable in dentistry as in surgery. And

in reviewing this matter we assume with confidence that the *beginnings* of decay are at the surface of the tooth, and that the agent or cause of it, whatever we may decide it to be, must reside in the menstruum in which the tooth is perpetually enveloped. How, then, shall we interpose a sure, safe, and effectual preventive? Prior to the publication of the paper "Prophylaxis in Dentistry" in 1898, there were a few feeble sporadic suggestions wholly in the direction of germicidal washes, but practical, beneficial results were entirely wanting. How could there be beneficial results from the occasional use of a doubtful germicide when the one and only remedy is the entire, positive, and frequent removal from tooth-surface of all matter inimical to tooth-life as well as to its composition?

Let us make a simple indisputable test. A devitalized tooth, sometimes but improperly called a "dead tooth," is generally conceded to be subject to more rapid decay in the mouth than a similar tooth with a living pulp. Let a pulpless, decayed tooth be removed from a mouth where the environments are such that resolution is rapidly taking place, and let it be placed in water, alcohol or glycerin, or simply exposed in the air, and we know that decay is immediately arrested and that further disintegration results only with the lapse of years.

It is wholly unnecessary to institute a process of artificial decay to prove the fact that when a tooth, good or bad, hard or soft, is removed from its environments—from the menstruum of the mouth—decay is at once arrested. The discovery and enunciation of the important fact that enforced and systematic change in the environment of the teeth in the mouth will prevent decay and carry with it many other beneficial results is new—new in essence, new in conception, and new in its elaboration—and results wholly from clinical investigation and experimentation.

Treatment of the teeth for complete change of environment, briefly stated, consists in thorough removal at frequent and regular intervals—once a month has thus far proved most satisfactory—of all accumulations, whether solids, inspissated excretions, semi-solids, or bacterial formations, from all the exposed surfaces of the teeth, leaving the enamel, or whatever of the tooth may be exposed, thoroughly polished and thus in the best condition to void hurtful deposits and equally to favor all efforts of the patient in the direction of cleanliness.

It is readily demonstrable that to secure and maintain true cleanliness in the mouth, even on the part of the most painstaking, is impracticable if not impossible without the direction and assistance of an expert and intelligent operator. There are calcific deposits constantly increasing; the more immediately hurtful acidulated bacterial accumulations; inspissated mucus retaining decomposing particles of food and furnishing most favorable conditions for bacterial culture and the retention of excretions, not alone from the gum margin, but from the whole gum surface. Besides these there are irregularities; formations and positions inaccessible to all ordinary methods of cleansing, which implies the perpetual retention of matter inimical to the teeth and gums. These injurious accumulations with their equally injurious emanations, hitherto overlooked and disregarded by physician or dentist, are not only causes of decay, but are equally causes of absorption of alveolar structure and recession of gums. These latter conditions are far more to be dreaded than simple decay.

Recognition will yet be made of the important fact that to the presence of foreign matter on and about the teeth, rather than to the quantity of it, the beginnings of decay and pyorrhea are wholly attributable; and the deleterious influence of a breath perpetually loaded with offensive emanations from this source, especially during seasons of salivary inactivity, as in sleep, we believe will ere long be disclosed as an important factor in many pulmonary and digestive disorders, and will be taken account of in medical diagnosis and treatment.

An interesting series of experiments to determine the precise conditions under which disease germs are carried by droplets of saliva when a person speaks or coughs or sneezes is described by Hermann Königer. "The author has been able to assure himself that in an apartment where there was no appreciable current of air a person speaking, coughing or sneezing could scatter germs to a distance of more than seven meters (twenty-two feet). The dissemination in speaking is different in different individuals, and the germs scattered abroad through the air by means of these droplets remain in suspension for only a short period. These droplets are really microscopic balloons having in the centre a bubble of air. The dissemination of these droplets, with germ-originating capabilities and tendencies, is most marked during coughing and sneezing. The dissemination by

'means of droplets is especially to be feared in case of small microorganisms, such as the germ of influenza, of plague and of pneumonia. The *bacillus prodigiosus* and the *bacillus mycoides* are not carried so far, and the danger of infection is consequently lessened. * * * The more pathogenic microbes the mouth contains the greater the danger. Washing the mouth has the effect of decreasing the number of diphtheritic bacilli susceptible of being detached. Placing the hand or a handkerchief before the mouth prevents the emission of droplets charged with tubercle bacilli. In cases of pneumonia it would be necessary to wear a mask in front of the mouth. During a surgical operation no one present should speak. Measures might of course be multiplied indefinitely as suggested by this important idea of the scattering of microbes by droplets of saliva."

In view of the fact, as herein set forth, of the imminent and ever-present danger of infection from the inhalation of bacilli-producing droplets of saliva from mouths almost universally infected, is it not time for dentists and medical men to awake to the importance of enforced and positive cleanliness for mouth and teeth? The prophylactic treatment advocated in this paper contemplates the absolute and positive removal of the unseen but real bacterial plaque present in some situations on every untreated set of teeth, as well as the removal at frequent intervals of gum exudation, heretofore unsuspected and untouched, and the frequent and perfect polishing by hand methods of all exposed tooth-surfaces. The establishment and maintenance of these conditions in the mouth has been found not only possible, but the feasibility of it has been fully demonstrated.

The process has been more commonly alluded to as cleaning teeth, but there is a wide distinction between the ordinary methods of "cleaning the teeth" and this system of prophylactic treatment. The difference is, first, in appliances and methods; second, in extent and thoroughness of the operation; third, in the persistence and frequency of the treatment; fourth, in the object sought and the results attained—the prevention both of decay and pyorrhea.

When necessary scalers should be used for the removal of solid deposits and such mucous concretions as may have been the means of softening or causing a partial decalcification of cervical enamel; and this should be perfectly attained. Following this the teeth should be *thoroughly polished on all exposed surfaces*—the labial,

buccal, palatal, lingual, mesial, distal, and, in cases of developing teeth, the occlusal as well. The hand-polishing with stick and pumice should reach to every exposed portion of the tooth, and be continued until the touch, which can be educated in this matter to distinguish better than the eye, gives evidence of thorough cleansing and polishing. The operation is best done with properly shaped orange-wood sticks charged with powdered pumice-stone. The prepared orange-wood is most conveniently handled and carried to positions desired by an efficient and properly shaped porte-polisher. We believe there is no such thing as "a positively clean tooth," unless it has been made so by some special artificial process of cleansing.

The grit of not too finely powdered pumice-stone has been found best adapted for removing viscid mucoid accumulations and for polishing enamel surfaces; and what is even more important, the friction of the stick and pumice as applied by hand—for *power-polishers should never be used*—seems to excite or stimulate the vital forces of the tooth to increased activity in the removal of waste and the deposit of new and better material. The effect has been likened to massage treatment for muscular tissue. The benefits resulting from this treatment are most marked and extend to all parts of the tooth. Whilst the deciduous and young permanent teeth are most responsive, all classes of teeth and teeth of all ages are peculiarly and positively benefitted, as is plainly shown in them after a few months of regular and careful treatment.

The benefits are not to the enamel or treated surfaces alone, but results are equally pronounced in pericementum, gums, the alveolar structure, and apparently in the dentin and cementum. There are striking exhibitions of change and improvement of color in the enamel, while it is apparently taking on from month to month a firmer texture and a more compact resisting structure. The change in color is from an opaque, old-ivory appearance to that of clear, translucent, polished enamel, the whole giving the appearance of increased density and general improvement, denoting decay-resisting structure; the apparent stimulation from the treatment rapidly changing the color of the tooth, diminishing its sensitiveness, both externally and internally, and greatly improving its quality; changes which have astonished the author as perhaps no other results from operations on the teeth or in the mouth have ever done.

But let it be clearly noted that our claim is that, whilst in this endeavor after change of environment the teeth are rendered immune, this result is by no means the only benefit, if, indeed, it is the most important. Unlooked-for outgrowths from this treatment in other directions have been both surprising and satisfactory; developments have been so rapid as to make it difficult to keep pace with them. Again and again I have been compelled to advance what I had considered to be the extreme boundary lines into new territory.

Starting with the discovery of the true method for the prevention of tooth-decay, it quickly extended into the domain of tooth-betterment. There is an evident stimulation of the life forces of the tooth in this treatment, both through the pulp and through the pericementum and its adjuvants. The pulp is stimulated to the work of taking up the old stagnant, color-giving matter, and to the laying down into a more perfect organization of new, health-giving elements. The unsightly yellow in the crown and the dark brown so frequently found in the cervical dentin of exposed roots are replaced by the clear, translucent matter, best comprehended under the term tooth-color. I have seen in several instances, as a result of this treatment, the irregular unsightly white spots on labial faces of front teeth, a condition indicative of interrupted nutrition between dentin and enamel, resume a normal life-like appearance; and in a greater number of cases the dark brown in root-exposed cervical dentin replaced by matter of normal color.

Influence on Gum Tissue—A constant and by no means inconsequent result of the treatment is a decided change of condition in appearance and in fact of the whole gum tissue. This change is more quickly noticeable than that in the teeth themselves. Relieved of the irritation due to the presence of the toxic matter at the cervix, the gums begin at once to lose the abnormal sensitiveness which often attaches to them, as well as the dark, congested appearance, indicative of the presence of an irritant, and to take on, especially over the alveolar process, a beautiful and permanent *striation*. Improvement in the festoons is equally noticeable, they assuming a more regular and pleasing appearance; there is change for the better in the whole aspect of the mouth.

Benefits to Alveolar Structure.—Of the better, more regular and harmonious alveolar development resulting from this treatment I do not care now to speak with great emphasis, and only from the clinical

standpoint. As the larger percentage of my patients who are under this treatment are in the period where the alveolar structure is endeavoring to make room for developing teeth (ranging from four to twenty years of age), the opportunity for observation on this point has been of a fairly satisfactory nature. In every case where the eruptive process has been specially noted, from the first to the third molar, there has been apparently an easier and a more natural eruption of the tooth, accompanied with less irritation to the surrounding parts; the expansion of the alveolar structure has been natural and proportionate to the room required for the erupting teeth. In several instances where from the crowded condition of the jaw development, especially of the cuspid teeth, seem to have been arrested, the relief afforded by this treatment—the frequent removal of obstructive matter on the teeth and from about the gums of the necks of the teeth by hand-polishing—has induced a resumption of the retarded eruptive process, and the teeth are now steadily and satisfactorily pressing their way into normal position. I am more and more convinced that the practice of early interference with protruding cuspids, through other means than endeavoring to induce alveolar expansion, is radically wrong and to be discouraged.

This treatment is greatly beneficial to the general health, removing as it does at regular intervals the excretions of gum and alveolar tissue, as well as the viscid mucoid accumulations gathered especially through the mischievous working of nocturnal mucus. It prevents the introduction of much solid toxic matter into the stomach and lungs; it greatly relieves the breath of offensive odors and of disease-giving bacterial culture, and maintains a condition of cleanliness for the mouth unattainable by other means. To the undisturbed presence of toxic matter on and about the teeth we charge the beginnings of all gingivitis and all pyorrhea; hence it should be the true preventive, as it is when properly directed, the one remedy for this dread disorder.—*International, Dec., 1901.*

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ACTION OF ACIDS IN VARIOUS STRENGTHS ON TOOTH STRUCTURE. By Herbert Johnson, D.D.S., Macon Ga. Read before Georgia State Dental Society. All the theories which have heretofore been advanced regarding caries of the teeth have not disproven the common-sense fact that acids are the direct agents involved in the disintegration and breaking down of tooth struc-

ture. It is not the object of this paper, however, to show how these acids are formed, whether their presence in the mouth is due to bacteria, fermentative processes, or a disordered condition of the digestive organs, but rather to try to prove which of them is the most destructive. Knowing this and knowing which of the three hard structures of the tooth are most readily attacked by the various acids, we may then set about adopting some plan by which the evil consequences of their presence in the mouth may be avoided. The acids being common remedies used extensively by dentists in treating pathological conditions of the oral cavity, and being also frequently prescribed by physicians for various disorders of the system, it seems proper that we should attempt to discover more of the nature of the destructiveness of these agents than mere imaginary or hearsay theory.

It is a common belief that tinct. of chlorid of iron is destructive to the teeth, and when the modern physician prescribes this medicine he immediately warns his patient to take it through a quill or glass tube. But do we *know* that it is a destructive agent, and if it is, which of the three hard tissues does it attack the most readily, enamel, cementum or dentin? We are told by dental surgeons to use sulphuric acid fifty per cent in treating pyorrheal troubles in the gums and alveoli and in opening up closed and inaccessible pulp canals in devitalized teeth. But have we ever had any practical tests made to prove to us whether sulphuric acid in such a strength or in *any* strength, is a safe remedy to use about the unprotected surfaces of teeth. The object of this paper is to turn attention to this line of thought, and with this object in view a number of experiments were made with the acids in common use, in various strengths, and the result of which you will now be asked to consider.

Experiments were conducted with the acids sulphuric, hydrochloric, nitric, acetic, trichloracetic, and pure lemon juice. These tests were made by immersing sections of teeth in various strength solutions of these acids for twelve hours. The teeth were prepared by being cut into sections, that enamel, cementum and dentin might be equally exposed to the action of the acid, and that the result might be more accurately determined. Five solutions of sulphuric acid were made—five, ten, twenty, thirty and fifty per cent. In the fifty per cent solution the enamel of the specimen was not attacked

to any great extent, but the cementum and dentin were badly disintegrated, especially that portion of the dentin surrounding the pulp chamber and canal. The effect of the thirty per cent solution was exactly the same, except that it was more active at every point. The twenty per cent solution had destroyed more enamel on its specimen than either of the others, but had attacked the cementum and dentin to a less degree. The five and ten per cent solutions had likewise attacked the enamel more and the cementum and dentin less than the stronger solutions, but were not so active as the twenty or thirty per cent solutions. From these tests it would seem to be proven that the thirty per cent solution of sulphuric acid was the most active of all these solutions and therefore the most dangerous. It also seems to be proven that the weaker solutions, five, ten and twenty per cent, were more active on enamel than any of the other tooth structures. These results could, however, have been slightly affected by a possible difference in the specimens. One may have been more vulnerable at one point than another, or of a different degree of density, and therefore have had more resisting power than another to the action of the acids. The hydrochloric acid was tested in four strengths of solution, five, ten, fifteen and twenty-five per cent. The twenty-five per cent solution had attacked and removed every vestige of enamel and every particle of lime had been extracted in a most wonderful manner from the other tissues, leaving the outer form of the tooth unchanged but very soft and flexible like leather. The fifteen per cent solution had acted exactly as the stronger, removing the enamel entire and extracting all the lime from the cementum and dentin. The ten per cent specimen was an old dense, yellow molar; but the acid, even in this weakened form, had removed all the enamel except a very small area, and the other parts of the tooth were rendered soft and flexible. The five per cent had destroyed every particle of enamel from the specimen, but had not succeeded in softening all of the cementum and dentin. Had it had more time there is hardly a doubt but that it would have done so. These tests seem to prove that hydrochloric acid is most active on enamel, but that its action is very energetic on all the tissues, destroying them completely, even in weak solutions. It also seems to prove that the stronger the acid solution the more destructive the action. The acetic acid tests were made in four solutions, five, ten, twenty-five and thirty-five per cent. The thirty-five per

cent had affected slightly all the tissues of the specimen, the enamel showing a slight softening on the outer surface and the dentin and cementum being only slightly affected. The twenty-five, ten and five per cent solutions showed a very similar action to the stronger acid, except less in proportion to the strength. These several tests of acetic acid therefore seem to prove that this is a comparatively harmless acid, which would prove destructive only after long and continuous contact with the tooth.

One test was made with trichloroacetic acid twenty per cent. This specimen showed exactly the same action as the hydrochloric weaker solutions. It had commenced to remove the enamel very thoroughly, and the thinner parts of the specimens, where the action had proceeded from both sides, had been rendered soft and flexible.

One test was made with nitric acid, a twenty per cent solution. This specimen showed the same action on the cementum and dentin as the hydrochloric and trichloroacetic acids, but the enamel had not been severely attacked and was left in a fairly good state of preservation. This seems to prove that twenty per cent nitric acid is most energetic on cementum and dentin.

Pure lemon juice was used in making one test. This specimen showed that its enamel had been attacked quite severely, especially at points where the enamel had been previously cut or broken, leaving the long axis of the rods exposed. The dentin had been disintegrated in the proximity of the pulp canal and chamber. This test seems to prove that lemon juice is a decidedly dangerous substance, being equally as destructive as twenty per cent sulphuric or five per cent hydrochloric acids. It also shows that it is most destructive where the enamel has been previously cut, as around the edges of a cavity or margin of a filling.—*Dental World*, Dec. 1901.

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TEETH OF PITHECANTHROPUS ERECTUS. By Dr. Oscar Amoêdo, Paris. In 1898 I gave in my treatise on "Dental Art and Legal Medicine" an anatomical description of the teeth of *Pithecanthropus erectus*—a description that differed notably from those made by the savants up to that time. I should not have returned to the subject if the discussion had not brought forth more recent papers of exceptional interest, of which the principal one is that of G. Schwalbe. The interest taken in the subject by Emperor Will-

iam II, and also by an American millionaire, Mr. Vanderbilt, is well known. As in the discussion raised by this subject the examination of the dental organs is of first importance, I again take up the matter and complete my first description. I consider it the duty of the dentist to take part in the discussion, and as the excavations have put us in possession of several dental specimens, to give the results of my investigations. Our profession has been so often accused of empiricism that we ought not to lose an occasion to show what the resources of our art can contribute to general knowledge in the relations of odontology with general science.

I will state briefly the history of the question. In 1891 Dr. Eug. Dubois, a Dutch military surgeon, found in Java, in the formation belonging to the upper Pliocene or to the most ancient Post-tertiary period, portions of a skeleton consisting of the top of the cranium, two molar teeth, and a femur. In his description of these pieces he attributed them to an animal intermediate between man and the large anthropoid apes, that is, in other words, the true ancestor of man, or the *Pithecanthropus erectus*. M. Manouvrier said that it so happened that the three pieces found were exactly those from which we could draw the best conclusions as to the form and size of the encephalus, the attitude of the body, and the importance of the maxillaries in their relation to the cranium.

Laying aside everything that does not concern the dentist directly, we will occupy ourselves with the molar tooth found near the cranium. It is an upper third molar, according to M. Manouvrier, of which the grinding surface alone has the aspect of a human tooth. Its volume, the direction antero-posterior of the crown, and the extensive separation of the roots do not permit us to attribute it to man. On the other hand, it differs from the teeth of the gorilla and the chimpanzee. M. Manouvrier has searched the Broca Museum for a tooth of the same development. After having examined the crania of a hundred negroes of Africa and New Caledonia he found such a tooth in the skull of a New Caledonian, a Kanalian. It is a lower third molar, but we know that the lower third molars are generally larger than the uppers, the former sometimes attaining a giant size, the latter sometimes being of a stunted growth. As for the upper third molar, he could find none resembling the Java tooth. He considered it as belonging to an anthropoid or to an extinct human race. It was on comparing the large size of the tooth with

the small dimensions of the cranium that Dr. Dubois found himself, he believed, in position to say that he was in the presence of an ancestor of man, the most ancient known up to that time.

I will not enter into a debate with the savants regarding the skull. Some of them, as Cunningham and Turner in England—consider it a human skull; others—as Kräus, Virchow, Luschen and Waldeyer—believe it belongs to an anthropoid. M. Manouvrier, while proceeding with extreme caution, attributes the greatest importance to Dr. Dubois' discovery and is inclined to his opinion. He had an opportunity of seeing the pieces when Dr. Dubois was in Paris, and has contributed another communication. He was struck by the complete state of fossilization of the bones, a state comparable to that of the pieces of Trinil and Neanderthal. The skeletons of the most ancient of the Post-tertiary period—those of Spy, for instance—have preserved an aspect but little different from the neolithic ossifications.

The examination of another tooth found near the first, and of the existence of which M. Manouvrier did not know until later (an upper second molar according to him), and a comparison of it with the first tooth, has enabled him to dispose of the theory attributing it to an anthropoid. He concluded that he was in the presence of a race of the forerunners of man and one anterior to the race of Neanderthal and Spy.

I will call attention to a recent work presented to the Academy of Vaucluse by M. Gabriel Bourges. This author, having knowledge of the existence of but one tooth attributed to the Pithecanthropus, has perpetuated in his description the old errors committed by the anatomists who had examined it; and I believe I have been the first to call attention to the fact that the long diameter of the crown is transversal (bucco-lingual) and not antero-posterior (mesio-distal), as has been said. As most of the ethnological considerations are drawn from this abnormal direction of the tooth, it seems well to give my opinion upon the anatomical characters of these teeth. We have two upper teeth, a left first molar and a right third molar. The roots are of a dark red, almost black; the crowns white. The crowns are swollen, blistered, narrowing rapidly toward the neck, with the exception of the mesial face, which, by compression against the neighboring tooth, is markedly flattened. The grinding surface of the first molar is so worn away that it no

longer presents the fissures and tuberosities that existed there normally. The wear has left a surface a little concave, following the bucco-lingual diameter. The third molar, on the contrary, has not been worn away, except that a small tubercle on the mesial border shows some slight traces of wear. The roots are short and the palatal root of the first molar diverges a little. All the roots of the third molar, the palatal and the two buccal, which two are united, are strongly divergent.

First molar. This tooth has been considered by the anatomists who have described it as being the second molar. If we compare its anatomical characteristics with those of the first molar we find an absolute resemblance. In fact, its crown, looking at its grinding surface, has the form of an ovoid, and its greater mesio-distal axis is situated on the palatal or lingual side. With the second molar, on the contrary, the grinding surface has a diameter mesio-distal larger on the buccal side. Besides, the disto-lingual fissure, which has disappeared from the grinding surface, crosses the marginal lingual border and appears on the entire lingual surface of the crown and root, dividing the tooth into two lobes, mesial and distal. This is a characteristic never found in a second molar, its lingual surface being always round. As for the roots, the palatal is flattened in the linguo-buccal direction, as in all first molars, while in the second molars it is round. Of the buccal roots the mesial is longer and larger than the distal, and is grooved throughout its entire length, giving the appearance of two roots united, which is probably the case, as there seem to be two apical foramina. The distal root is slightly rounded, and is united to the mesial. There is no doubt in my mind as to this tooth being an upper left first molar.

Third molar. Contrary to the descriptions that have been given of this tooth, we find that the longer diameter is linguo-buccal (transversal) and not mesio-distal (antero-posterior). In general its crown is larger than the ordinary type of upper third molars. Its form is about normal; it is flattened on the mesial (anterior) face by the pressure exerted by the second molar, this face terminating at the buccal and lingual extremities in sharp angles, being rounded at the three other faces, so that they conform with each other. This is a characteristic of all third molars, however, owing to their position at the extremity of the dental arch, having no tooth to compress the posterior surface. Its palatal root is short, relatively

diverging, and is flattened in the bucco-lingual sense. On comparing it with the first molar it is rounded. Its two buccal roots, also diverging, are united, the mesial (anterior) presenting an analogy with the same root of other tooth, that is, it is grooved as is that tooth in its entire length. The distal root is longer.—*Cosmos, Dec., 1901.*

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INFLUENCE OF METALS IN THE DEVELOPMENT OF MICROORGANISMS IN GELATIN. By Dr. Fritz Schenk, Vienna, *Oest-Ungar. Vier. f. Zahn.*, Jan., 1901. Reviewed for *International* by Dr. W. H. Potter. The author gives Miller the credit for making the first experiments along this line, and for showing that certain metals had the power of hindering the development of bacteria. His experiments were especially concerned with those metals commonly used as filling materials. Behring later confirmed Miller's experiments and extended the knowledge as to the controlling action of gold and other metals upon the growth of various bacteria. Behring held that there was a solution of the metal in the gelatin brought about by the by-products of the growing bacteria, and that only on this supposition could the controlling action of the metals upon the growth of bacteria be explained.

The author starts with the results obtained by Miller and Behring and undertakes a further development of the subject. His method was to place a piece of metal in a culture medium which had been infected with bacteria, and then to note whether the metal hindered or not the growth of bacteria. In this way were tested gold, silver, zinc, tin, lead and iron. Of these metals lead and tin showed no restraining influence over the growth of bacteria. With iron the effect was very slight. Gold, silver and zinc, on the other hand, showed a marked influence. The influence of zinc was most marked. Further investigations were made to establish the duration of this action. It was found that at the expiration of twenty-four hours gold still exercised a controlling influence upon an infected gelatin, and that silver held a still greater influence than gold. Lead and tin exercised no influence at all. Iron showed only a very slight influence, while zinc showed the most lasting influence of any of the metals used. The conclusion which the author draws from the last experiments is, that none of the metals exercises a lasting effect upon the growth of bacteria.

After establishing the above results by repeated experiments, a

further series was undertaken to determine whether the liquefaction of gelatin by heat was at all influenced by the presence of metals. For this purpose culture gelatin was heated in a water-bath and found to become fluid at 24 to 25 deg. Celsius. But where the metal zinc was present under similar conditions the gelatin did not become fluid until 32 deg. Celsius had been reached. The author feels that he has established the fact that such metals as hinder the growth of bacteria in gelatin also compel a higher temperature for its liquefaction. In reaching this conclusion experiments were made with zinc, silver, gold, platinum, iron, lead.

The theory that a solution of a part of the metal occurs in the culture gelatin is favored by the author. And in this way a reason is given for the controlling influence which various metals have upon the growth of bacteria, and also for the ability which many possess of requiring a higher temperature for the liquefaction of culture gelatin. If one seeks to gain some practical points from these very interesting observations upon the influence of metals upon the growth of bacteria in culture gelatin he will be somewhat disappointed. For while several of the metals—notably zinc, silver and gold—exercise a decided influence upon bacteria, this influence is only of short duration, and could hardly be considered of much value if relied upon in the case of a filling-material.

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RESTORATION OF THE NORMAL OUTLINE OF GUM-TISSUE BY MECHANICAL MEANS. By W. A. Mills, D.D.S., Baltimore. Read before the Association of Dental Surgeons, Baltimore, Oct. 16, 1901. In this paper attention will be called to the use of quick-setting amalgam and paraffin, either alone or in combination, for replacing the lost parts of roots where they have been fractured to a considerable extent along the lines of their shafts, also for preserving the normal outline and fullness of the gum-tissues covering the labial surfaces of the six superior anterior teeth. In the majority of cases the break extends from the cervix to near the apex, often carrying with it more or less of the thin bony covering. If allowed to remain for only a short while before surgical interference the soft tissues become inflamed, causing more or less absorption of the alveolus along its whole length. To splint such roots is useless; consequently they have been extracted, producing a contraction of the bony tissue and a corresponding depression of

the gum-tissue; and when substitutes have been inserted to replace the lost organs their artificial character has been so pronounced that the beauty of an otherwise pretty or handsome face has been disfigured. To overcome this, and to preserve the beauty and natural outline of the tissues, so essential to life-like prosthetic work, the following is respectfully submitted for consideration: Before removal of the loosened part at the root to be treated, separate it from the soft tissues, being careful not to injure or tear them, for more depends upon this for success than anything else. After removal of the fractured part, clean it and sterilize the fixed portion of the root, seal the apex with pink gutta-percha, make undercuts along both sides of the pulp-canal, insert screw post in the solid portion towards the apex, and fill with a quick-setting amalgam. Allow sufficient material to make up for the lost parts of the filling out of the gum contour. In very simple cases amalgam alone will do, but when the fracture is deep seated and the alveolus is expanded, first fill against the bony structures with paraffin and the remainder finish with amalgam. The amalgam will protect the paraffin; for while the latter is non-absorbable, and perfectly congenial to all vitalized tissues, it is slightly compressible at blood temperature and might be forced out of shape by mastication or the pressure of a plate if it were not so protected. Before dismissing the patient be sure that the amalgam in contact with the soft tissues is as smooth as possible, with no overhanging edges. At the second appointment the surface of the amalgam must be highly polished with a thin orange-wood stick and fine pumice-stone. In the course of a few months you will be pleasantly surprised to notice how closely the gum-tissues have adapted themselves to the surface of the amalgam, and how very healthy they are, notwithstanding foreign bodies lie embedded within their folds.—*Brief, Dec., 1901.*

BURNS TREATED WITH PURE CARBOLIC ACID.—Dr. J. L. Muench, in the *Medical News*, thus gives the rationale of the treatment of burns with pure carbolic acid: "Externally carbolic acid acts as an escharotic when applied in the pure state, combining with the tissues and destroying them. Strange to say, however, its action on a burned surface as an escharotic is neutralized by the albuminous effusion becoming coagulated, and local anesthesia of the peripheral nerves takes place. The general result on burns treated with carbolic acid is that there is complete exclusion of air and coagulation of the serous effusions, and the healing process takes place with much less suffering and in a shorter time than by any other method."

DECISION IN FAVOR OF WISCONSIN STATE BOARD OF DENTAL EXAMINERS.

No. 158.

STATE OF WISCONSIN. IN SUPREME COURT.

STATE OF WISCONSIN, ex. rel., W. L. COFFEY,
Respondent,

vs.

C. C. CHITTENDEN, et al., constituting the State
 Board of Dental Examiners,

Appellants.

APPEAL FROM THE CIRCUIT COURT FOR MILWAUKEE COUNTY.

Action for a peremptory writ of mandamus to compel the State Board of Dental Examiners to license the relator to practice dentistry in the state of Wisconsin. The petition in the main is as follows, omitting formal parts: May 11, 1901, the relator was duly awarded a diploma by the Department of Dental Surgery of the Wisconsin College of Physicians and Surgeons, of Milwaukee, Wisconsin. He had taken three full courses of lectures of seven months each, the last two being at such college. It was a duly incorporated institution under the laws of this state, authorized to grant such diplomas, and was a reputable institution of its kind. May 21, 1901, the petitioner, upon his said diploma, applied to the State Board of Dental Examiners for a license to practice dentistry in the state of Wisconsin, tendering a fee of one dollar to the board, and making proof of the corporate organization of said college. May 28, 1901, said board refused to grant the petitioner's application without examination. The members of the board are prejudiced against the petitioner and the institution which graduated him, and have unreasonably and maliciously determined that the graduates therefrom shall be examined by such board before being licensed to practice dentistry, upon the ground that such institution is not reputable, and have acted upon petitioner's application pursuant to such determination.

The board made return to the alternative writ, denying all the allegations of wrongful conduct recited therein, and alleging that its refusal to license the petitioner without an examination was solely because, after a fair and impartial investigation of the college which graduated him, the conclusion was reached that it was not a reputable institution.

The issue thus formed was brought to trial before the court June 20, 1901. Proof was then adduced of what the board acted upon in reaching the aforesaid conclusion, as follows: In April, 1900, the college in question, desiring to join the National Association of Dental Faculties, applied to the state board of dental examiners for its approval thereof, that being a prerequisite thereto. Its rules as to eligibility to membership therein have been substantially adopted by the board, as to what constitutes a reputable dental college. Such rules require, among other things, that no college shall receive a student from another college, giving him an advanced grade, except upon the evi-

dentary certificate of his work at the latter being verified by its dean, and upon the same conditions that would have been imposed by it, the facts in that regard to be ascertained by conferring with such institution. As a basis for action upon said application, the board visited said institution and subjected it to the test of said rules, in the course of which questions were asked of the persons in charge thereof, their answers being taken down by a stenographer. Among such answers were in substance the following: The number of students at the institution is 88. The faculty is without a dean. Students are taken from other colleges without investigation as to their standing at such colleges. All members of the faculty are paid except two. Students have not been received for less than the legal fees stated in the catalogue. The institution advertises for customers to be practiced upon at the institution. An investigation of the truth of such answers resulted in a discovery that three members of the faculty were not paid salaries, and that the number of students was 21. The result was a conclusion not to approve of said application, which was communicated to the faculty of the applicant. From time to time after the occurrences stated the members of the board in an individual way made inquiries as to the character of the dental department of said college. Confirmatory of the information obtained as aforesaid, that students were received at the college from other institutions and given advanced standing without adequate knowledge to base such action upon, an instance was brought to the attention of the board where a student was admitted to the college who had failed in his examination at another college and left there dissatisfied on that account, and was given credit for full time spent at the institution from which he came, without examination. No formal investigation was made after the one mentioned. On the information then obtained, and that acquired subsequently by the individual members as stated, the decision was made in May, 1901, that the institution in question was not reputable.

The court, against objection, received evidence tending to explain some of the objectionable matters which the board discovered or concluded existed in April, 1900, and evidence showing that the board was mistaken in such conclusions as to other of such matters, and that those which in fact existed were removed prior to the graduation of the petitioner. The court delivered an opinion to the effect that the members of the board acted in the utmost good faith in deciding against the petitioner's application upon the ground that the college that graduated him was not reputable, but that it proceeded outside its discretionary authority in that it based its conclusion upon facts existing in April, 1900, without any investigation as to the actual condition of things in May, 1901; that had the facts upon which the board acted in April, 1900, existed in May, 1901, they would have justified the conclusion then reached; but that the conditions had changed so that at such later date the college was in fact reputable.

Findings of fact were accordingly filed, which are in substance as follows: When the Wisconsin College of Physicians and Surgeons graduated the petitioner, and when he applied for a license to practice his profession, it was a duly organized corporation under the laws of this state, entitled to issue

diplomas such as the one granted the petitioner, and was a reputable institution. The requisites for admission were, as a minimum, a certificate of entrance into the second grade of a high school or its equivalent, or a diploma from a reputable medical college, school of pharmacy or veterinary medicine. The requirements of dental students for graduation were, attendance upon three full courses of at least seven months each, the first two of which might be pursued in any reputable dental college having the same or equal standard of requirements, the faculty having the right, however, in any case to require an examination. A license was refused the petitioner wholly upon the ground that the college was not reputable. The decision was made without any immediate investigation of the institution, hence the conclusion reached was not the result of legal discretion. The board wrongfully refused to license the petitioner, to his damage in the sum of \$2 and costs to be taxed. Upon such facts the court concluded as a matter of law that the petitioner was entitled to a peremptory writ of mandamus requiring the State Board of Dental Examiners to license the petitioner to practice dentistry in the state of Wisconsin, and judgment was entered accordingly.

Marshall J.—"It is elementary that in mandamus proceedings to coerce a judicial officer or any person or board in the exercise of judicial or quasi-judicial power, the sole legitimate purpose thereof is to set such person or board in motion; to command him or it to act, not how to act—to exercise the judicial power vested in him or it, not to control as to the conclusion to be reached. *State &c. v. Kellogg*, 95 Wis. 672; *State &c. v. Johnson*, 108 id. 591, 628; *State &c. v. Teal*, 72 Minn. 37; *Merrill on Mandamus* 40. Where there is no reasonable ground to justify a decision by such officer or board other than one way, and there is a failure to act accordingly, the function of a mandamus proceeding is broad enough to remedy the mischief by compelling the making of such decision, in perfect harmony with the rule that the office thereof is not to control discretionary authority, but to compel the exercise thereof. *State &c. v. Johnson*, *supra*. That is to say, if the law imposes the duty upon a judicial or quasi-judicial body to do a particular thing upon determining that certain facts exist, and reasonable inquiry be made by it in respect to such facts, and from the information thus obtained there is no reasonable ground for any conclusion other than that the conditions precedent to the performance of such duty exist, and a decision is made to the contrary or performance thereof is refused, such conduct is not the exercise of discretionary power, but a refusal to exercise it—a refusal or neglect to perform a plain duty imposed by law; and there being no adequate legal remedy, the way is open for the extraordinary jurisdiction of the court to award its writ of mandamus. It is plain that in such a situation the court does not deal with disputed facts. It acts upon the theory that the person or body in duty bound to find the facts in accordance with the evidence, in refusing to do so, goes beyond or refuses to exercise his or its jurisdiction, and is, on that ground alone, a subject for coercion by mandamus. *State v. Johnson*, *supra*."

Applying the foregoing stated principles to the record before us, it is manifest that the learned circuit court proceeded erroneously from the begin-

ning to the end of the trial we are called upon to view. Assuming, for the moment, that the State Board of Dental Examiners decided that the institution which graduated the relator was not reputable solely upon evidence of its character one year previous to the date of such decision, as the circuit judge seems to have supposed, and that such course was unreasonable, that it should have acquired information as to the character of the college at or about the time of the graduation of the relator, and that in neglecting to do so it failed to exercise a legal discretion—that did not give the court any warrant in this proceeding to do what the board ought to have done, and compel it to accept the court's conclusion on questions of fact upon evidence produced for the first time therein, questions which the board had exclusive jurisdiction to try and determine. In attempting to do so the court usurped the functions of the board most completely. It might as well have issued a license directly to the relator as to try the question *de novo* as to the reputation of the institution graduating him, and coerce the board into executing its judgment. Manifestly the court having come to the conclusion that the board decided properly as to the reputation of the Wisconsin college, except for the remoteness of the evidence upon which the decision was based, and that it failed to exercise a legal discretion because it did not determine the question presented for decision upon direct evidence of the character of the institution at or about the time it graduated the relator, the relief granted should have been limited to a judgment awarding a writ of mandamus compelling the board to proceed and determine the question at issue by a proper investigation. While what is the reasonable limit of such an inquiry is a judicial question, the inquiry itself cannot be taken from the board by the court otherwise than by a clear usurpation of power.

The next question for consideration is, Was the trial court right in holding, as a matter of law, that evidence establishing non-reputability of the institution in April, 1900, was not sufficient to warrant a decision that its character was the same at the time it graduated the relator. We know of no rule by which such holding can be justified. The learned court in his opinion did not attempt to ground the decision on principle or authority, and counsel for respondent must be acquitted of any such attempt in this court. Responsibility of an institution of learning obviously has to do with its actual character in that regard measured by those competent to judge thereof. It rests on conditions that do not ordinarily change in a day or a week or a month. It does not spring up or pass out of existence suddenly. It is one of those conditions which when once established is presumed to continue, not indefinitely, but so that lapse of time only weakens the force of the presumption as evidence, and may so weaken it that no one could reasonably be affected thereby. Many illustrations of the rule might be given, that where a situation is once established it is presumed to continue, in the absence of evidence to the contrary. The existence of particular relations between persons being established, a presumption of their continuance arises. (Appeal of Reading F. I. & T. Co. 113 Pa. St. 204.) A person once proven to have been a gambler is presumed to have continued such, in the absence of evidence of his reformation. (McMahon v. Harrison, 6 N. Y. 448.) Cover-

ture once sworn is presumed to continue. (*Erskine v. Davis*, 25 Ill. 251.) The same is true of bad character for truth and veracity (*Sleeper v. Van Middlesworth*, 4 Denio 481); and as to a particular mode of doing business (*Lawson on Presumptive Ev.*); and with malice of one person toward another (*State v. Johnson*, 11 red. 854). Opinions of individuals and mental states, once shown to exist, are presumed to continue (1 Greenl. Ev. 41). A person shown to be alive at one time is presumed to continue so for the period of seven years. These illustrations amply indicate the general scope of the principle under discussion. It is grounded on common knowledge that conditions of things and character of persons change gradually as a general rule, when they change at all. The exceptions only go to the weight of the presumption of continuity and class it with rebuttable presumptions, but it remains probative to some degree in some cases for a great length of time. No general rule can be stated as to when its force will become so weakened by time as to render it too remote to be considered at all, or to be given weight sufficient to prima facie establish the fact to which it points. There are exceptions to this as in case of the continuance of human life. In Greenl. Ev. 41, the general rule is stated thus: "When the existence of a person, a personal relation, or a state of things is once established by proof, the law presumes that the person, relation, or state of things continues to exist as before until the contrary is shown or until a different presumption is raised, from the nature of the subject in question." On the subject of character, lapse of time is not considered to so weaken the presumption of continuance as to render evidence thereof at a period of four years prior to the date of the inquiry irrelevant. (*Sleeper v. Van Middlesworth*, supra). In *McMahon v. Harrison*, evidence of character two years prior to the time of the act to be affected was held relevant."

Enough has been said to indicate pretty clearly that evidence of the character of the institution in question in April, 1900, was proper to be considered in determining its character in May, 1901, and that the trial court erred in holding to the contrary. Further, assuming that such evidence was the only proof before the board of the reputability of the college in 1901, and was sufficient to establish non-reputability in April, 1900, it did not transcend the bounds of reason for the board to decide that it was sufficient to establish the same condition in May, 1901, in the absence of any satisfactory evidence to the contrary. The trial court seems to have supposed that if the board acted on information acquired at the earlier date, it failed to find non-reputability in May, 1901. "The reputability of a dental college which the board is obliged to consider must depend upon the facts that exist at the time of such consideration," said the learned trial judge; and further, "They can neither be facts that have existed in the past nor those that may possibly exist in the future, but they must be present facts upon which the board may exercise its judgment." We cannot approve of that doctrine. Of course, the question of fact which the board was required to solve was whether the institution was reputable when it graduated the relator. But facts and circumstances evidentiary of non-reputability, proven to have existed a considerable length prior thereto, were relevant, and might be sufficient, unex-

plained, to establish the ultimate fact involved, if such were the judgment of the board acting within the bounds of reason. The trial court seems to have confused mere evidentiary with the facts, for it is elementary, as we have seen, that in solving a controversy such as the one the board had to deal with, while the situation at a particular time in the final point to be reached, facts establishing the situation within any reasonable period prior thereto by reasonable inference extends to such point, indicating where the truth lies. That method of establishing controverted facts is so general that we may safely venture to say it cannot be found condemned by any reputable authority.

We have been unable to discover how the trial court came to the conclusion that the decision of the board was based wholly on evidence of the character of the school in April, 1900. The record does not read that way. There was testimony that the board in January, 1901, made an investigation of the standing of students that graduated with the relator, which resulted in obtaining what was supposed to be reliable information that four or five of his class failed in from four to six studies in their first year's work, which was taken at the Milwaukee Medical College; that they were received into the Wisconsin College and given credit for full time spent at the former institution; that the relator was one of the persons so received; that when he was received he was deficient in several branches; that he did not thereafter pursue them in any regular way; that the result of such investigation was persuasive with the board that the condition which they found in April, 1900, existed in 1901. There was further evidence to the effect that from time to time the members of the board, in an individual way, gathered information as to the institution, and further, that though the decision as to the reputability thereof in 1900 was well known to its faculty, no application was made thereafter for a reinvestigation, and that no proof was offered by the relator or by his associate graduates, when the board was requested to license them, to remove its impression that the school was not reputable. We have not stated all the evidence, but have stated enough to show clearly that the trial court grievously erred in holding that the board acted solely on information it obtained in April, 1900.

The learned counsel for respondent, as it seems, insists that the judgment appealed from is right and should stand regardless of whether the reasons therefor, given by the trial court, are tenable, and regardless of whether the board rightly decided that the school was not reputable in April, 1900. In that, as we take it, counsel concedes, what the trial court did not, that proof of the condition of things in April, 1900, tended to establish the condition existing in May, 1901, but contend that it was unreasonable to hold at the earlier date, from the facts then before the board, that the school was not reputable. In that, as it seems, the same mistake is made that was made by the trial court, i. e., the assumption that the board in 1901 acted solely on the information obtained in 1900. But, waiving that a moment, we will consider the proposition submitted by counsel. It must be conceded that the law under which the board acted required them to determine, as a question of fact, whether the relator was graduated by a reputable dental college.

It is made their duty to license, without examination, any regular graduate of an incorporated, reputable dental college which requires that candidates for graduation shall attend two full courses of lectures of five months each, the last of which courses shall be attended in the college which issued the diploma. The law does not attempt to define reputability, but uses the term in its ordinary sense and in such a way as to indicate that an institution may satisfy all the other requisites to a license and yet not be reputable. Other courts that have had to deal with similar laws have reached the conclusion that the term "reputable" is not used in any restricted or particular sense, but to convey its common meaning, the meaning generally ascribed thereto in every-day ordinary expressions calling for its use. That must be so, since there is nothing in the law indicating to the contrary. In *People v. Dental Examiners*, 110 Ill. 180, it was contended that the law, in providing that a diploma, to entitle its holder to a license to practice dentistry without an examination, must be issued by a reputable college having other characteristics similar to those required by the statutes of this state, left the board no duty to perform in determining reputability except to ascertain whether such other characteristics existed; that the establishment thereof established reputability. Such contention was condemned by the court, as appears from the opinion, as hardly worthy of serious consideration, in being held that "reputable," as the term is used in the law, means reputable and nothing else; that it is not equivalent of the other requisites mentioned therein, but is an additional requirement. The soundness of that decision cannot be reasonably questioned. In passing upon the application of a graduate of a dental college for a license to practice his profession the board must necessarily, by the exercise of judgment, determine whether his diploma comes from a reputable source, precisely as they must determine any other statutory requisite, and *reputable* must be deemed to mean *reputable* in the ordinary sense; "Worthy of repute or distinction; held in esteem; honorable; praiseworthy."—*Webster's Dictionary*. "Being in good repute; held in esteem; consistent with good faith."—*Century Dictionary*. (*Dental Examiners v. People*, 123 Ill. 227, 245.) What is reputable in a dental college must necessarily be determined, too, from the standpoint of men of scientific attainments in the line of work it represents, not that of mere laymen. The purpose of the law itself sufficiently indicates that. Moreover, the terms thereof leave no reason for doubt on the question. It provides that the members of the board shall be practicing dentists, and that the majority thereof shall be members of the Wisconsin State Dental Society.

Notwithstanding what has been said, doubtless the board might, in determining the reputability of a college, act upon such trifling circumstances as to be guilty of an abuse of their discretionary power and be a proper subject for coercion by mandamus, but it would take a strong case to warrant a court in convicting them of such an offense. The board here discovered that the Wisconsin College was without a dean, and it is in testimony that such a head for a dental faculty is indispensable to reputability of their institution from the standpoint of men learned in the dental profession. They further discovered that students were received and given advance standing, contrary

to the common understanding among college men of what is necessary to graduation with good scholarship and fitness for the practice of dentistry, and in a way liable to result in clothing disreputable men with honors of the school, and which resulted in diplomas being awarded to all of the class of 1901 without their having come up to the standard necessary to enable them to pass examination in several branches of study. The board further discovered, as they honestly supposed, and had a right to suppose—whether they were right or wrong on the facts is not material—that the persons in charge of the school were guilty of false pretenses in that 33 students were claimed to be in the institution, when there were but 21; and that all members of the faculty were paid salaries but two, when in fact three were not so paid. The board further discovered that the conveniences for imparting knowledge to students, and the manner in which the instructional work was carried on, were deficient in several material particulars. They examined three graduates of the class of 1900 in several branches as to the work during the last year of their course, the only time spent by them at the college, and found that they were deficient therein, not up to a reputable standard and unfit for graduation. Considerable other information was obtained upon which the conclusion of 1900 was based.

Enough has been stated to show that the trial court was right in holding that the conclusion reached in 1900 was amply justified by the evidentiary facts which the board supposed and had a right to suppose then existed, regardless of the real truth of the matter. Certainly, in the face of the evidence detailed, no room is left to say the board then abused its discretion assuming that it was then acting officially. It does not take a person possessed of special knowledge of the requisites of a dental college to render it capable of doing good work and be deemed worthy of praise, to understand that the faculty must have a head, commonly called a dean, possessing and efficiently exercising the powers incident to that position, and that it must have proper facilities for imparting scientific knowledge to students, and that the instructional work must be carried on in the manner supposed by members of the profession of dentistry in good repute to be reasonably necessary to praiseworthy work; further, that the institution must be so conducted as not to permit persons to wear its honors by graduating on the strength of work at other colleges, not properly evidenced as up to a reputable standard; and that those responsible for its management must not be guilty of any false pretenses in respect to any matter connected with its organization or otherwise, which the state board of dental examiners has a right to inquire into.

The learned circuit court erred in holding, as it seems to have done, that every time a person presents himself before the board as a candidate for a state license to practice dentistry, tenders his dollar, presents his diploma, and makes proof of the statutory requisites for the granting of his application, other than that of the reputability of the school graduating him, it is the duty of the board to make an original investigation of and determination as to that subject, by direct evidence of the character of the school at the time of the candidate's graduation, regardless of whether any evidence on

the question is tendered by him or any request is made for such investigation. The burden in such a case is on the candidate to demonstrate to the satisfaction of the board the reputability of his alma mater, not on the board to establish or disprove it. Having once rendered a judgment, so to speak, on a reasonable investigation, condemning the school as not reputable, the board may properly consider such judgment *res adjudicata* when the same subject again comes in question, in the absence of evidence fairly rebutting the presumption of the continuance of the former condition. The attitude of the relator indicates a desire for the benefits of the law, but a defiance of reasonable requirements. He was the proper actor to bring to the attention of the board the character of his school. If he had accepted that burden and offered proof to show that his alma mater was reputable, doubtless the board would have received and considered it in connection with all the other information in its possession. Had he requested the board to specify wherein it supposed the school was not up to a reputable standard, and made a reasonable showing that new light could be shed on the subject, it would doubtless have given him the desired information and reasonable opportunity to furnish such new light, or proceeded independently of him to obtain it. To say that the board, of its motion, under all circumstances, on every occasion of an application by a graduate of a dental college for license to practice his profession, is bound to make an investigation of the question of the reputability of the school, is to advance a proposition that has no support either in the letter or the spirit of the law or any principle governing such bodies. The character of the school having once been fairly determined by the board, when and under what circumstances a reexamination of the subject should be made must necessarily rest solely in its discretion so long as it acts reasonably. Obviously a refusal to reinvestigate the subject is warranted under ordinary circumstances till, by lapse of time or by some circumstances brought to the attention of the board, reasonable ground is furnished for a belief that a material change has or may have taken place. Circumstances alter cases. Where the facts are so easily ascertainable as they were in this case, the subject for investigation being within reasonable reach of all the members of the board; assuming, as we must, that they would be actuated in passing upon the application for a license by the single desire to deal justly; and that they would be willing, as they manifestly should be, to resolve reasonable doubts in favor of the candidate, so far at least as relates to the making of inquiries on questions of fact upon which his application must turn, lapse of time after one investigation, sufficient to allow a new class of graduates to come from the school, would secure a new reinvestigation of its character if that was requested, accompanied by a reasonable showing of a material change in regard to the matters in which it was found deficient upon the previous investigation. The policy of the law under consideration, so long as it stands the test of constitutional limitations, and that is not here questioned, is something with which courts have nothing to do. Since it requires the board to pass upon the reputability of the school in circumstances like those in this case, and places no limit upon the methods by which it shall gather information bearing on the subject for decision, it may

proceed in any reasonable way, and candidates for license must submit to its judgments unless they transgress the boundaries of reason and common sense.

To recapitulate, we hold that the trial court erred—1. In misconceiving the functions of mandamus proceedings, in that, while the court may compel a judicial or quasi-judicial officer or body to perform its duty, it cannot compel performance in any particular way where the underlying questions of fact are disputed. 2. In trying *de novo* the question of the reputability of the college in question. 3. In attempting to coerce the board into licensing the relator, yet deciding that it had not determined by a proper investigation the existence of the condition precedent to such action. 4. In deciding that the board acted wholly on evidence of the character of the college in April, 1900. 5. In deciding that the board acted illegally because it determined the character of the college wholly upon circumstantial evidence. 6. In holding that the evidence of the reputability of the institution in April, 1900, had no legitimate bearing upon its character in May, 1901, and was not under any circumstances sufficient to show its character at a later date. 7. In awarding a writ of mandamus based on facts determined by it *de novo*.

With the question of whether the trial court determined correctly, upon the evidence before it, the question of the reputability of the Wisconsin College, we have no concern, since, as indicated, the whole proceeding, as a trial *de novo*, was erroneous. The trial court should have viewed the decision of the board from their standpoint, not from its original investigation on the subject. We are unable to perceive that the board exceeded its discretionary power or so failed to exercise such power as to be guilty of an abuse thereof.

By the Court.—The judgment appealed from is reversed and the cause is remanded with directions to dismiss the action with costs in favor of the defendants.

SYLLABUS.

1. The scope of mandamus proceedings to coerce a person or board to the performance of a judicial or quasi-judicial duty extends only to compelling such person or board to act, not to directing him or it how to act, unless the underlying facts are undisputed, leaving no reasonable ground for action other than one way.

2. If a person or board is clothed with judicial or quasi-judicial power in the determination of questions of fact and the taking of some specific action upon such determination, and fails to make a proper investigation of such questions, it is not within the function of a mandamus proceeding, predicated on such neglect, for the court to assume and exercise the duty of such person or board and make such investigation.

3. The character of a dental college or other institution of learning at a particular time may be established by evidence of its character at a prior time not so remote but that it would be reasonable to assume that the prior condition still exists. The rule applies that, "when the existence of a person, a personal relation, or a state of thing is once established by proof, the

law presumes that the person, relation, or state of things continues to exist as before, until the contrary is shown, or until a different presumption is raised, from the nature of the subject in question."

4. The character of a dental college in April of one year is evidentiary of its character in May of the next year, and may have sufficient probative force in that regard to reasonably establish such later character.

5. The word "reputable," as applied to dental colleges in the law authorizing the state board of dental examiners to license persons to practice the profession of dentistry, without examination, who have graduated at such a college having certain specified requisites, means *reputable* in the general sense in which the term is ordinarily used; worthy of repute or distinction, held in esteem, honorable, praiseworthy.

6. In passing upon the application of a graduate of a dental college for a license to practice his profession in this state, the board of dental examiners must determine whether his diploma comes from a reputable source as an independent fact, considering the term "reputable" in its ordinary sense and measuring the character of the college from the standpoint of men competent to judge thereof by reason of their scientific attainments in the line of work for which such a college stands.

7. The state board of dental examiners, proceeding reasonably, is the sole tribunal under the statutes to determine the questions of fact to be solved, precedent to the licensing of a person to practice the profession of dentistry in this state.

8. When a graduate of a dental college applies to the state board of dental examiners for a license to practice his profession, the burden of proof is upon him to establish the reputability of such college.

9. The state board of dental examiners, having once determined the character of a dental college, may properly consider all questions in regard thereto at rest till, by lapse of time or otherwise, some reasonable ground exists for believing that its character may probably have changed.

10. The state board of dental examiners, having once determined the character of a dental college within all reasonable limits, when and under what circumstances the subject shall be reexamined rests solely in its discretion.

11. Since the law does not define the method by which the state board of dental examiners shall proceed to determine the reputability of a dental college when that is material to its official action, such board may perform its duty in that regard in any reasonable way it may deem proper, and candidates for licenses to practice the profession of dentistry must submit to its judgments so long as they are within the boundaries of reason and common sense.

CLOUDING OF MOUTH-MIRRORS.—Dr. Aufrecht has devised the following method for this difficulty: The mirror is first submitted to boiling water, and then placed in a one-half of one per cent solution of lysol. This method has the double advantage of sterilizing the mirror and of preventing its becoming clouded.—*Monatsschrift f. Ohrenheilkunde*.

Letters.

PULP AND DEVELOPMENT OF THE TOOTH.

FLORENCE, COL., Jan. 2, 1902.

To the Editor of the Digest,

MR. EDITOR:—I wish to ask a question which perhaps some of the readers of the DIGEST can answer. It is this—If the pulp in a half-erupted tooth be destroyed, will the development of the tooth be completed? Perhaps a better idea may be obtained if I state the case, which is this—A seven-year-old boy through an accident had the mesio-incisal angle broken off an upper right central incisor, so that the horn of the pulp could be discerned, making what appeared to be an exposure, although there was no bleeding. What is the best mode of procedure in a case of this kind?

Hoping some one may answer this in the February DIGEST, I am

Yours fraternally,

E. L. YARD, D.D.S.

THE BOSS PHILOSOPHIZES.

(As Told by the Office Boy.)

The mornin' after the Runaway (like I was a-tellin' the last time), the Boss come into the Offis after breakfast, smilin' like he hadn't ever felt a Ache or Pain. He set down to look over his Male. They was Seventeen Circulars each one a-warnin' dentists to be Offul Careful how they used any other kind o' Obtudent exceptin' the kinds they was. An' they was Eight Bills, some o' them a-sayin' they'd Sue the Boss, without he'd call an' Pay straight Off. I seen in the Boss's Eye how he kind o' pitied People that gits Mad an' threatens, when they'd orter See it ain't a-goin' to do the least Speck o' good. I guess he Ketched me a-peepin' over his shoulder (an' I wanted to see if they was any Checks, so as I'd git my Back Pay), so he said, "James, I wisht I could learn some people Patience, the same as us Dentists has to Practice. Lots o' people seems to think about nothin' else but Money. It's Money here, an' Money there, an' no Rest. The sin o' Avarice stalks abroad in the Land. It's the mark of a Low-Down, Grovelling Nature to be thinkin' about Dolers all the While. Don't you ever allow yourself to git to thinkin' Money is so mutch, James."

The Boss he tried to keep lookin' Straight Ahead, towards the Door, but it seemed like they was a sort o' Fascination about me, for in spite o' all, he Ketched my Eye, d'rectly. I was offul embarrassed. The only thing that kep' me from givin' the whole Shootin' Match away, was my havin' a Cock Eye. I knowed that he knowed that I knowed he couldn't tell whether I was a-lookin' at him or the Chandelier. Just then his Wife called him to know was there a Letter for her, an' that broke the Spell. He went on, "I've knowed some dentists, James, that had that Idea. Low, Ornery critters they be, every last one o' them. Always figgerin' out how mutch Money they're a-goin' to git out of a Job. Always complainin' if they can't pay their Debts. I say them kind o' dentists had orter git out o' the Perfession. Thinkin' more o' Money than they is of their Perfessional Pride! Money Grubbers is the wust Blotch on the Perfession today, James."

I was feelin' Offul Sneakin' by this time, an' had Haf a Notion to tell him he needn't mind about payin' me the Back Wages. It was the Biggest Relief when he took up a Newspaper an' shaded his Eyes. "You see, James, us dentists is the most Liberal Men, an' the freest from the Taint of Avarice, of any class o' Perfessional Men," he went on, absently lightin' a fresh Cigar with the largest Bill. "We work for People, an' after they've paid everybody else, we let 'em pay us. An' then we Turn Round an' we do the same way with other People—we pay 'em when we kin. Looks like everybody had orter be satisfied with the arrangement, don't it? Yet there's Lots o' People, an' even the Dental Depots, James, I blush to say, that'll look Grumpy at a dentist, without he pays up inside o' Sixty Days or so. Don't seem to make no allowances, James. Ain't got no Bowels of Compassion, Nor sentiment. Money Grubbers again, James, Scand'lous Money Grubbers!

"I mind when I entered the Dental College as a Student, the openin' lecture was all about how Noble a Perfession dentistry is. An' how Self-Sacrificin'. Derved if it ain't too, James. Ain't no special occasion for Rubbin' it into dental students though, that I kin see. May be all right to Learn 'em how Noble it is. But the Self-Sacrificin' part is somethin' any Freshman ought easy to Ketch onto. What got me so Mixed Up was this—from the way the Perfessor talked in that Lecture, I somehow got the Idee that the fundamental Aim of the Dental College was to *make* the incomin' mem-

bers of the Perfession Self-Sacrificin', an' Noble. I thought them things was a part of the Reg'lar Course. Later on I come to See that it was really the Gin'ral Public that made the Perfession Self-Sacrificin'. The job of Ennoblin' individual members seemed to have been left to the Dental College to attend to, as somethin' that didn't in no way concern the Gin'ral Public. What the Gin'ral Public seemed to have Uppermost in Mind, was to git its Teeth Pulled as cheap as possible. So the Gin'ral Perfession *had* to be Self-Sacrificin'. Their bein' Noble was somethin' they took upon themselves, somethin' wholly Extraneous, James. It's a Beautiful Spectacle, James, this of dentists studyin' to be so Self-Sacrificin' an' Noble! Some Perfessions that might be Named ain't Dignified thataway. They tell me Law Students seldom gits Bibles when they Graduate, an' they ain't no Great Stress laid on cultivatin' habits o' Self-Sacrifice. It ain't Assumed that things is so Lop-Sided. Its the Clients that's supposed to attend to the Self-Sacrificin' part. In short, the matter doesn't seem to be discussed at all."

The Boss he let slide a Big Sigh at this p'int. I couldn't understand all he was a-sayin', but I seen he was talkin' Sarcastic. All of a sudden he went off on another Tack, like he does sometimes. Says he, "James, if you've really made up your Mind to be a Dentist, I can put you in the way of makin' a lot more Money out o' it than what I've made." I was surprised when he said that, for I hadn't ever said a Word about bein' a Dentist, in fact I had decided lately I'd be a Undertaker, like he advised me once. They ain't so Offul Many funerals, an' you git to go to Base Ball. An' People stays still an' doesn't Squirm Round an' Pester you to Deth when you're workin' on 'em. An' if they don't Pay you kin dig 'em up an' Sell 'em to the Dental Colleges. But I never let on, an' d'rectly he said some more. It was Funny, but what he said was what I'd often thought I might say to him sometime. Said he, "Things wouldn't be so bad, James, if dentists would learn themselves to study Human Nature. An' they'd orter learn to rate themselves higher. You want to Remember, when you come to Practicin' Dentistry, James, that the Public rates a man jist about as he rates himself. Or a trifle lower. So you've got to Snort an' Blow an' let on' you're Eight Feet high, when you ain't only Five, an' then the Gin'ral Public will discount your claim a little, an' make you out to be about Seven Foot Four. It's a Curious fact, James, but

I've noticed this—you take a Man that gives out that he's a Deuce of a Feller, an' people will laugh at him, an' poke Fun at him, year after year. But they git tired o' Laughin' so Mutch, after a Spell, an' in the end they come to believe he really is a Deuce of a Feller. So you see, James, the man that gits along an' gains a firm standing with the public, is the man that ain't afraid of bein' Laffed at."

Here the Boss he swelled up his Chist, an' he Jammed his Thumbs in his Arm-holes, an' there he set with his Legs Crossed, an' a-swingin' one Eoot up an' down, keepin' Time with his Thoughts. An' he Squinted at me with one Eye half shet, kind o' Sly, like he mistrusted I wasn't Keen enough to understand what he meant. But I knowed well enough. I had to let on like I was most Offul impressed, an' how I did Admire to Hear him talk, an' after I'd nodded Haf a Dozen times, like I couldn't find Words to say how True it all was, an' how it seemed Strange other dentists hadn't ever thought about these Things, he went on. "Another thing, James, you take a man that's weak in one Perfession, an' he'll be weak in any Perfession. Lots o' dentists that's thinkin' o' changin' to some other Business doesn't seem to think o' that. It's mostly in the Man, James. It ain't in the Perfession so Mutch. The main thing is this, James, you've got to be firm with People. It's all right to git the Reputation o' bein' Good Natured an' Obligin, but it's jist as well sometimes to make People the Lest Mite afeard o' you, too. Some dentists seem to think if they Speak Up, an' say what they'll do an' what they won't do, they'll drive Patients away. But the truth is, the only way to keep some People froze to you, is to let on like you can't noway accommodate them. It's Offul Funny, but it's true, James. Say now for instance, you're a dentist, an' your Father comes in, an' he wants a Tooth filled. You say to him, 'I ain't meanin' no Offense, but the fact is, I ain't so Offul Stuck on Workin' for my own Kin. I reckon you'd better go to Dock Peabody, acrost the Street.' The Old Man he looks kind o' Hurt, an' says he: 'I don't think I'd dare trust any dentist but you.' So then you go ahead, an' you charge him Ten Dolers, when you're Done, an' he says, 'I'm Offul Obligated,' an' he pays you right away, an' don't ast for no Receipt, but when he Goes Out he says, 'I feel like that was a Mighty Good job.' But if you say in the Start, 'This fillin is worth Ten Dolers at a low estimate, but

you bein' my Dad I'll do it for Three Dolars, 'cause I wouldn't like you to go to no other dentist,' why he'lli forgit all about the Ten Doler part, an' he'll be Privately thinkin' you'd order do a mighty fine Job for Three Dolars, an' when you're Done he'll say, 'I'll jist watch a Bit an' see how this is a-going to do, an' some day you'll git your Pay, all right.' So you'll have to wait Six Months before he'll Pay."

I was wishin' the Boss would let up, so as I could read a book about "The Boy Detective." He's got a way of sayin' these things about once so often, to kind o' Brace himself up, after somebody has Bluffed him. But he kep' a-goin' still, an' this time he said things I didn't remember ever Heerin' him say before. Says he: "James, you want to remember another thing, if you're a-goin' to be a Dentist, us Dentists isn't Capitalists, like Business Men, an' people isn't supposed to have Runnin' Account's with us, like we was the Corner Grocery. When the work is Done the bill had order be Paid, right away. An' another thing, James, No dentist had order be ast under any Circumstances, to work under his Usual Fees. Sometimes people comes in here, an' they wants me to do that Very Thing." (I thought I'd listen, now, for I recalled Mis' Richards, an' how she got so mutch work done for Nothin', only the Day before, an' I was Curious to See if he Dast Pertend he'd forgot all about that, a-ready.) "They'll bring in some Poor Relation, an' they'll ast me outright to do the work Cheap. Then I say, 'I'm Offul Sorry, but I can't do it; it demoralizes my Practice to lower my prices, an' besides, I find in the end I'm left to puzzle out a kind o' Chinese enigma, tryin' to Find Out who is Reely Responsible for payin' the Bill. Some People seems to think I am. You look after your own Private Charities an' I'll look after mine. Don't ast me to go into Cahoots with you.'"

The Boss he begun lookin' Offul Stiddy at my Game Eye again. It seemed like it was a Snake charmin' him. I looked back, jist as Stiddy, like I was havin' my Picture took. It was like us two was in Swimmin' an' a-tryin to see which could keep his head under longest. I thought I'd Bust, but I beat him about Half a Second, he had to Look Away first. It was him looked Guilty, not me. "I know I hain't always lived up to these Sentiments, James. It ain't reely only lately that I've been impressed with these truths. But I kin say in all candor, James, the work o'

Reform has Set In good an' strong with me. You'll see I'm a Different Man, from this on. People ain't a-goin' to Bluff me no more, you kin Bet."

The Boss went on a-sayin' a Lot More, but I was behind the fire screen readin' my Book, and all I remember about the rest he said was jist when he was Gittin' through. Says he, "The most important thing is this, James, you musn't let patients Dictate to you. If you do you're Lost."

So then he Went Out in the yard to help take in the Wash, an' presently I let in a Lady. When the Boss come in she said, "I've been recommended to you as a Dentist that is reasonable in your Charges, an' I want two Teeth filled. But I always make a Bargain first, so you must be Reel Reasonable, an' not charge me too Mutch." So the Boss he smiled an' said he hadn't had no Complaints on that Head, but lots o' Dentists complained 'cause he worked so Cheap, an' he wasn't in no Combine, an' lots o' Stuff. Then he looked at the teeth an' says he, "Them's large Cavities, an' it'll take me Two Hours, an' I guess I'd orter git about Four Dolers for the Job, 'cause it's bigger than some. In fact, Four Dolers is Reely too Cheap."

The Boss he stood a-blinkin' at her, an' a-lookin' kind o' ashamed, like he knowed well enough he was a-tryin' to Bilk her out o' Two Dolers. I was wonderin' what I could say to Help Out, when the Lady she spoke up. Said she, "That is a Exorbitant Charge, I'm sure. You done some for my sister, an' you only charged her a Doler apiece." So the Boss he looked in his Book, an' says he, "Them wasn't so Big, though." But she looked him straight in the Eye, an' says she, very firm an' onflinchin', "I kin git this work done jist as good in Pokeberry Junction, where I live, an' I've had my mind made up for some Time, that Two Dolers was as mutch as I could afford to spend on my Teeth, they've cost so mutch a'ready." Then the Boss he said, after pertendin' to think it over a Minute, "Well, all right; I don't want to be Mean about it." So he went to Work, an' when he was about Haf Done, he found they was Two Other decays in the other sides of the same Teeth. So says he, "You hadn't orter hold me down to takin' Two Dolers, when they's Two More Cavities that I didn't see." But the lady she said a Bargain was a Bargain, an' she Let On like she wouldn't pay Nothin', without he'd fill them other places too. So the Boss he Got Red, but he Went On an' done it. An' when he was all done she said kind o' Stiff, "if you'll make me out a Receipt I'll pay you now." Then she was Offul Dignified while she was puttin' on her Things, an' she said "Good Day, Sir," kind o' Freezin' in her Manner, an' I knowed we'd never do any more Work for her.

FRANK W. SAGE.

Cincinnati, O.

The Dental Digest.

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At 2231 Prairie Avenue, Chicago,

Where All Communications Should be Addressed.

Editorial.

CROWN COMPANY'S FAVORABLE DECISION IN THE JAMES ORR KYLE CASE ANNULLED BY JUDGE TOWNSEND BECAUSE OF COLLUSION.

Our readers will remember that on July 31, 1899, Judge Townsend gave a decision favorable to the International Tooth Crown Co. by reversing the former decision of the Court which declared the Low bridge patent to be invalid. The defendant in the case was one James Orr Kyle, a brother-in-law of Dr. L. T. Sheffield, the president of the Crown Co. From the start we suspected collusion, for we knew that the Crown Co. had bedeviled the testimony and witnesses which the Protective Association put forward in the previous suit, and that Kyle had not stood all if any of the expense of his defense.

In November, 1900, upon our motion and petition, Judge Lacombe directed Sheffield and Kyle to attend and submit to an examination before a Mastery in Chancery as to our allegation of the collusive and fraudulent character of the suit in question. The examination of these two individuals began November 8 and lasted until the 14th, and disclosed the fact that the entire expense of both sides of the litigation—the Crown Co. and Sheffield on one side as plaintiffs, and Kyle on the other as defendant—was borne directly and indirectly by the Crown Co. and Sheffield. Upon cross-examination Kyle admitted that he never even went to the alleged lawyer's office, and that the only contribution he made to his defense, directly or indirectly, was "carfare and drinks for his attorney."

Having thus proven that the Kyle case was won by fraud, the Protective Association presented this evidence to Judge Townsend and filed a petition asking that he set aside his former decision in the case and also make the Crown Co. stand the costs of taking the testimony before the Master above referred to.

Briefs were filed by the Association and Crown Co., and the matter was argued before the Court by the lawyers on both sides. January 20, 1902, just as the DIGEST was going to press, we received a telegram from the Association's local attorney in New York City, stating that Judge Townsend had set aside his former decision in the Kyle case on the ground of collusion. We cannot give full particulars this month, but in the February DIGEST will take the matter up in detail. Suffice it to say that this affords great cause for congratulation to the members of the Association and the profession at large, for conditions are now about the same as they were five years ago, when the Low bridge patent had been declared invalid, and the Crown Co. have no more if as much ground for or hope of success in their warfare upon the dentists of this country than they had at that time.

POWER OF DENTAL EXAMINING BOARDS.

On page 58 of this issue we print a recent decision by the Supreme Court of the State of Wisconsin, which upholds a late ruling of the Wisconsin State Board of Dental Examiners, and not only defines the power and scope of that board, but establishes precedents for all similar organizations. Reference is made therein to a decision of the Supreme Court of the State of Illinois (People vs. Dental Examiners, 110 Illinois, 180). As this decision is quite as far-reaching and definite as that of the Wisconsin Court, we give same herewith. On March 18, 1883, a young man holding a diploma from a dental college in another state presented his diploma to the Illinois State Board of Dental Examiners and asked for a license. For some reason which does not appear the board refused to issue a license to him to practice dentistry in this state, so the young man applied for a writ of mandamus compelling the board to issue him a license. The writ of mandamus was refused, and in commenting on the matter the Supreme Court of the State of Illinois delivered the following opinion:

It is provided by the first section of an act approved May 30, 1881, entitled "An Act to Insure the Better Education of Practitioners of Dental Surgery, and to Regulate the Practice of Dentistry in the State of Illinois," that "It shall be unlawful for any person who is not at the time of the passage of this act engaged in the practice of dentistry in this state to commence such practice, unless such person shall have received a diploma from the faculty of

some reputable dental college duly authorized by the laws of this state, or of some other of the United States, or by the laws of some foreign country, in which college or colleges there was, at the time of the issue of such diploma, annually delivered a full course of lectures and instruction in dental surgery." And in the sixth section of the same act, after providing for examination before the board of dental examiners of all applicants for license to practice dentistry, is the following provision: "But said board shall at all times issue a license to any regular graduate of any reputable dental college, without examination, upon the payment by such graduate to the said board of a fee of one dollar." Other provisions of the act prohibit any person to practice dentistry without a license from the board, except such as are properly enrolled as having been practitioners at the time of the passage of the act.

The contention of the relator is, that the Board of Dental Examiners have no power to decide what is or what is not a "reputable dental college"—that the law has itself defined what is a "reputable dental college," in providing that it shall be "duly authorized by the laws of this state, or of some other of the United States, or by the laws of some foreign country, in which college or colleges there was, at the time of the issue of such diploma, annually delivered a full course of lectures and instruction in dental surgery." We are unable to appreciate the force of this position. The word "reputable" would seem to be used here to express the meaning ordinarily attached to it. If it had been intended that diploma from any dental college, or a diploma from any dental college "duly authorized by the laws of this state, or of some other of the United States, or by the laws of some foreign country, in which college or colleges there was, at the time of the issue of such diploma, annually delivered a full course of lectures and instruction in dental surgery," we must presume the language would have so said. By using the word "reputable" we must presume the General Assembly meant "reputable." And since it is not used as being the equivalent of and convertible for the other requirements in regard the college, but as in addition thereto, we must presume it was intended to be so construed.

As a part of the current history of the times, and as an aid at arriving at the legislative intention, we know there were colleges of different kinds authorized by the laws of states in which they were located, in which there were pretended to be annually delivered full courses of lectures and instruction upon the arts and sciences professed to be taught, that were not "reputable" because they graduated for money, frequently without any reference to scholarship. A diploma from such an institution afforded no evidence of scholarship or attainments in its holder. It was a fraud and deserved no respect from anybody, and it was as against such diplomas the law was intended to protect the public, and therefore required that the colleges be "reputable." Whether a college be reputable or not is not a legal question but a question of fact. So, also, are the requirements in regard to the annual delivery of full courses of lectures and instruction. These questions of fact are, by the act, submitted to the decision of the board—not in so many words, but by the plainest and most necessary implication. Their action is to be predicated upon the existence of the requisite facts, and no other tri-

bunal is authorized to investigate them, and of necessity therefore they must do so. The act of ascertaining and determining what are the facts is in its nature judicial. It involves investigation, judgment and discretion.

The office of the writ of mandamus is, in general, to compel the performance of mere ministerial acts prescribed by law. It lies, however, also to subordinate judicial tribunals, to compel them to act where it is their duty to act, but never to require them to decide in a particular manner. It is not, like a writ of error or appeal, a remedy for erroneous decisions. (Judges of Oneida Common Pleas v. People, 18 Wend, 92.) And, as is said by the court in *People ex. rel. v. Common Council of Troy*, 78 N. Y. 83: "This principle applied to every case where the duty of performance of which is sought to be compelled, is in its nature judicial, or involves the exercise of judicial power or discretion, irrespective of the general character of the officer or body to which the writ is addressed. A subordinate body can be directed to act, but not how to act, in a matter as to which it has the right to exercise its judgment. The character of the duty, and not that of the body or officers, determines how far performance of the duty may be enforced by mandamus. Where a subordinate body is vested with power to determine a question of fact, the duty is judicial, and though it can be compelled by mandamus to determine the fact, it cannot be directed to decide it in a particular way, however clearly it be made to appear what the decision ought to be." See, also, *Kelly et. al. v. City of Chicago*, 62 Ill. 279.

Illustrations of the principle will be found in *People v. Common Council of Troy*, *supra*, *Freeman v. Selectmen*, 34 Conn. 406, *Hoole v. Kinkead*, 17 Nev. 217, *Bailey v. Ewart*, 53 Iowa 111, *Berryman v. Perkins*, 55 Cal. 488, *People v. Contracting Board*, 27 N. Y. 878, and other cases cited in argument by the Attorney General.

The demurrer here does not admit that the board of dental examiners found that the college at which the relator was graduated was reputable, although it does admit that to be the fact. But since the board cannot be compelled to decide the question that way, although the evidence might clearly sustain it in so doing, there is no ground for mandamus. The demurrer must be sustained, and the petition dismissed.

For many years there has been considerable friction between the dental colleges and the state boards of dental examiners, as to the respective powers of each. The Wisconsin and Illinois Supreme Court decisions seem to settle the matter for these two states at least, and we have no doubt the Supreme Courts of other states would decide in the same manner if test cases were brought before them. It will probably be admitted by all concerned that the colleges have no power to make laws to govern anyone but themselves. The state is their creator, and they are subject to its laws and its discipline just as are any other corporate institutions. The state frames laws for the government of all within its borders, and no

exception is made in favor of any college or individual. The college may grant its diploma, but it can issue no license to practice. This power belongs to the state alone, and for the purpose of carrying same out it has its agency in the state board of dental examiners.

When the diploma reaches the board the powers and functions of that body are brought into action. If not already done, it becomes its duty to determine the reputability of the institution which issued the diploma, and here the question of reputability becomes almost the paramount issue. If the members of the board are not already sufficiently advised, their duty carries them into an investigation of the college itself, to a knowledge of the course of study of the arts and sciences taught by it, and the degree of efficiency to which they are taught. The board also has the right to ascertain the degree of education and moral caliber possessed by all students who are received for matriculation, and to know the character and worth of all teachers connected with the college.

While the stand taken by the courts on these questions may come as a surprise to some, we know that no "reputable" college will object, as it has nothing to fear, in fact, it will be glad to give as much information as possible to the board. Although it is only recently that the state boards have tried to enforce their authority, the fact remains that the dental colleges of their own free will have been steadily advancing, which is greatly to their credit. In the past the state boards have not been equal to the responsibilities imposed upon them, and not only have they been in most cases sadly remiss in their duty, but in far too many instances they have not been worthy of confidence or credit. Better men, however, are now being put on these organizations, and with such power back of them most capable dentists in this country should be willing to serve on them. On the other hand, none but those of undoubted ability and unquestioned honesty should be allowed to assume these responsible positions, and it will be to the interest of the colleges, the profession and the community at large to see that a wise choice is always made. The great majority of the dental colleges of this country are striving to elevate the practice of dentistry and to increase the fitness educationally and morally of those who enter our profession. The state boards can and should assist the progressive colleges in the forward movement, so that the schools as a whole will be materially benefitted and not harrassed by these court

decisions. With only good men on the state boards, and with those men trying working simply for the elevation of the profession and the protection of the community, we predict an era of unprecedented harmony between the colleges and boards.

Notices.

G. V. BLACK DENTAL CLUB.

The G. V. Black Dental Club will hold its third public clinic in St. Paul, Feb. 20-22, 1902. All dentists are cordially invited to attend.

J. M. WALLS, Sec'y., St. Paul.

VERMONT STATE DENTAL SOCIETY.

The twenty-sixth annual meeting of the Vermont State Dental Society will be held at Hotel Berwick, Rutland, March 19-21, 1902.

THOMAS MOUND, Sec'y, Rutland.

NORTHWESTERN ALUMNI ASSOCIATION CLINIC.

The Alumni Association of Northwestern University Dental School will hold its annual clinic at the College building, Madison and Franklin Streets, Chicago, Thursday, Feb. 22, 1902. All members of the profession are invited to attend.

G. B. MACFARLANE, Sec'y, 70 State St., Chicago.

A. V. HARGETT, Pres.

INSTITUTE OF DENTAL PEDAGOGICS.

The ninth annual meeting of this organization was held at Pittsburg, Dec. 31, 1901-Jan. 2, 1902, and after a very successful and profitable meeting the following officers were elected: Pres., H. J. Goslee, Chicago; V.-P., J. D. Patterson, Kansas City; Sec'y and Treas., H. B. Tileston, Louisville; Mem. Ex. Board, D. R. Stubblefield, Nashville.

WISCONSIN BOARD OF DENTAL EXAMINERS.

The next meeting of the Wisconsin State Board of Dental Examiners for examination will be held at Hotel Pfister, Milwaukee, Jan. 28-30, 1902, beginning at 9 a. m. Jan. 28. All examinations are conducted in the English language and in writing. A practical examination is also required, and all applicants must furnish their own instruments patients and material.

W. H. CARSON, D.D.S., Sec'y., Goldsmith Bldg., Milwaukee.

CHICAGO ODONTOGRAPHIC SOCIETY.

At the annual meeting of the Chicago Odontographic Society, held Dec. 16, 1901, the following officers were elected for the ensuing year: Pres., C. N. Johnson; V.-P., W. T. Reeves; Sec'y, F. H. Zinn; Treas., G. N. West. Board of Directors, G. B. Perry, F. E. Roach, L. O. Green. Board of Censors,

F. B. Noyes, W. Girling, D. A. Hare. Program Committee, C. E. Bentley, L. S. Tenney, H. J. Goslee. The fifteenth anniversary will occur in December, 1902, and it is the intention of the society to celebrate the event by giving a rousing clinic extending over two days and a meeting that will be memorable in its history. Prominent dentists from all parts of the country will be invited to be present. The program committee have already made plans for one of the most notable meetings ever held in this country.

F. H. ZINN, Sec'y.

SOUTHERN BRANCH NATIONAL DENTAL ASSOCIATION.

The fifth annual meeting of the Southern Branch of the National Dental Association will be held at Atlanta, Ga., Feb. 18-21, 1902. Atlanta is now the most favorably located and best equipped city in the South for holding such a meeting, which will insure a large attendance. The Southeastern Passenger Association has given a rate of one and one-third fare for the round trip on the certificate plan. An extension of ten days will also be given on these tickets after the close of the meeting, so as to enable those in attendance to visit the Charleston Exposition. A cheap round-trip ticket from Atlanta to Charleston will be on sale, and an effort will be made to have a special train for the dentists. Delegates living beyond the territory of the Southeastern Passenger Association can purchase a tourist's winter ticket to Charleston by way of Atlanta, as these tickets have a stop-over privilege of fifteen days at Atlanta. H. H. JOHNSON, Pres. S. B. N. D. A., Macon, Ga.

C. L. ALEXANDER, Cor. Sec. S. B. N. D. A., Charlotte, N. C.

CHICAGO ODONTOGRAPHIC SOCIETY BANQUET.

The annual banquet of the Odontographic Society of Chicago was held at the Palmer House Jan. 20, 1902, at 7 o'clock, and about 125 members and guests sat down to an excellent dinner. The following program was carried out: Dr. L. S. Tenney, the toast-master, filled that office in a very happy manner. He opened the ball with a bright little speech, and stated that he would have made it longer had his friends not made dire threats against his so doing, one man even going so far as to tell him such action was expressly forbidden by the constitution and by-laws of the Society. Prof. Edmund James of the University of Chicago followed with a masterly address. Dr. Edward Bak gave a piano solo which called forth an encore. Col. H. H. Blake recited an original poem, entitled "The Old Linden Tree," and graphically described the circumstances which led to his writing it. The Rev. Jos. K. Mason followed with an address, delivered in his usual eloquent manner. Dr. Homer A. Drake then sang "The Stein Song," and the company joined in the chorus, with a zest which showed them to be not unfamiliar with the title. In response to a vigorous encore Dr. Drake gave the old favorite, "Illinois," and "they all joined in." This was followed by a Gypsy song, after which "the DeReszke of Chicago," as Dr. Bentley termed him, was allowed to take his seat. Mr. Opie Reed, the famous author, closed the program with two or three of his inimitable stories, at least he thought

that would close it, but he had to respond to several encores. Impromptu remarks were then made by Drs. J. N. Crouse, C. E. Bentley and T. W. Brophy, after which the company broke up, everybody pronouncing the banquet one of the most successful and enjoyable ever held by this young giant among local dental societies.

News Summary.

C. F. SHEAFER, a dentist at York, Pa., died suddenly Dec. 25, 1901.

C. F. STIPP, a young dentist at Toledo, O., died Nov. 21, 1901, of typhoid pneumonia.

S. S. BROWN, 32 years old, a dentist at Chillicothe, Mo., was killed Dec. 18, 1901, by a fall.

J. B. SNOVER, 25 years old, a dentist at Philadelphia, died Dec. 28, 1901, from typhoid fever.

J. W. FRAZIER, 28 years old, a dentist at Sewickley, Pa., died Jan. 4, 1902, from typhoid fever.

GEORGE W. CALDWELL, 58 years old, a dentist at Philadelphia, died from apoplexy Jan. 1, 1902.

J. H. ALLEN, 81 years old, a dentist at Birmingham, Ala., died Jan. 14, 1902, from pneumonia.

CEMENT.—“There is no cement that will repair broken promises.”—*Ex.* Try good “Fellowship.”

J. P. KELLY, 31 years old, a dentist at Newburyport, Mass., died Dec. 18, 1901, from lung trouble.

C. A. MARVIN, 59 years old, a dentist at Torrington, Conn., died Jan. 10, 1902, from heart trouble.

H. H. ALLEN, 71 years old, a dentist at Thorntown, Ind., died Dec. 30, 1901, from a stroke of apoplexy.

PENNSYLVANIA DENTAL EXAMINERS issued licenses to 28 of the 44-applicants who came before them in December, 16 failing.

BANKRUPTS.—E. R. Angier, Boston, Mass., owes \$2,495.38, no assets. D. A. Baker, Phoenix, N. Y., owes \$1,097.17; assets, \$100.00.

PAINFUL EXTRACTION.—“What is the matter, old man, you look bad?” “Just been to the dentist and he extracted sixty dollars.”

E. E. HUGHES, formerly a prominent dentist in Des Moines, Ia., was sent to the State Asylum, Jan. 3, 1902. Drink brought on insanity.

EDWARD BOWLUS, 69 years old, formerly a dentist at Middletown, Md., died at Frederick, Md., Jan. 14, 1902, from hemorrhage of the lungs.

T. W. BECKWITH, 44 years old, a dentist at Sterling, Ill., died at Tucson, Ariz., Jan. 14, 1902, where he had gone last month for his health.

WILL TAFT, grandson of Dr. Jonathan Taft, died last month at Manila, P. I., where he went recently to engage in the practice of dentistry.

F. M. SIMCOOK, a young dentist at Burnet, Tex., was shot and killed Dec. 31, 1901, while resisting arrest. He shot first and fatally wounded the officer.

A. F. HUDSON, a young dentist, formerly of Nashville, Tenn., died Nov. 25, 1901, in Ecuador, where he went three years ago to establish a practice.

JOHN R. MCCOY, a young dentist at Bloomington, Ill., and formerly at Chicago, died suddenly Dec. 28, 1901, supposedly from an overdose of cocaine.

SPRINGFIELD (O.) DENTAL SOCIETY was organized Jan. 18, 1902, and Dr. T. A. Lewis was elected President and Dr. W. C. Lupfer Secretary and Treasurer.

WHAT "D.D.S." MEANS.—A subscriber to the DIGEST who is located in a rather unproductive town writes that in his case "D.D.S." stands for "Disgusted Dental Struggler."

THOMAS DELAVAN DEVOE, 69 years old, a dentist and member of a prominent Nova Scotia family, died of consumption Dec. 31, 1901, at St. Louis, and was buried in the potter's field.

ROBBERIES.—This time two unfortunates. A dentist at Los Angeles, Cal., had \$50 worth of gold taken from his office, and another at Dayton, O., lost \$25 in cash and \$15 worth of gold.

O. H. LANG, a dentist at Milwaukee, died suddenly Jan. 8, 1902. He was in the habit of taking morphin for insomnia, and it is thought that death was due to an overdose of the drug.

WESTERN INDIANA DENTAL ASSOCIATION at its January, 1902, meeting elected the following officers: Pres., C. F. Williams; V.-P., M. T. Goodman; Secy., B. B. White; Treas., R. Adams.

NERVOUS SPECIALIST NEEDED.—He—"You know if you worry about every little thing it is bound to affect your health." His Wife—"Yes, I know. That's one of the things I worry about."

ALLEGANY COUNTY (N. Y.) DENTAL SOCIETY at its annual meeting Jan. 14, 1902, elected the following officers: Pres., W. W. Coon; V.-P., James Wardner; Sec'y, W. F. Spargur; Treas., E. V. Sheerar.

MINNESOTA DENTAL BOARD.—The governor has reappointed Dr. C. H. Robinson of Wabasha to the state board of dental examiners for three years and Dr. J. M. Walls of St. Paul for the same period.

A DRAW.—The Nauvoo (Ia.) *Rustler* says that the city needs a dentist, and the *Independent* says that one could not make a living there. It may be necessary to appoint a board of arbitration to settle the matter.

ISAAC KNAPP DENTAL COTERIE.—The annual meeting of this organization took place at Ft. Wayne, Ind., Jan. 9, 1902, and the following officers were elected: Pres. J. H. Adams; Sec., E. E. Keel; Treas., J. D. Coyle.

CHILDREN'S TEETH CANNOT BE EXAMINED.—The dentists of Rochester, N. Y., recently requested the board of education of that city to allow them to examine the teeth of public school pupils, but the Board denied the request, on the ground that if dentists were allowed to examine the teeth other classes of people would want to examine the pupils' eyes, noses, feet, etc.

DENTAL TECHNIO CLUB (Kansas City, Mo.) at its regular meeting Jan. 11, 1902, elected the following officers: Pres., F. G. Worthley; 1st V.-P., S. E. Johnson; V.-P., K. P. Ashley; Sec'y, F. W. Franklin; Treas., R. M. Seibel.

"NORMAL SOLUTION.—A solution of known strength used in volumetric analysis, usually made so that one cubic centimeter contains a number of milligrams equal to the molecular weight of the compound."—*Standard Dictionary*.

LUZERNE AND LACKAWANNA COUNTIES (PA.) DENTAL SOCIETY met Dec. 17, 1901, and elected the following officers: Pres., E. J. Donnegan; V.-P., J. H. Meyers; Rec. Sec., E. J. O'Hara; Cor. Sec., O. R. Richards, Treas., Nellie Carle.

READING (PA.) DENTAL SOCIETY at its January, 1902, meeting elected the following officers for this year: Pres., E. W. Bohn; V.-P., George S. Schlegel; Treas., Elwood Tate; Secy., C. R. Scholl; Ex. Com., S. E. Tate, W. D. DeLong, H. L. Cleaver.

CLEAN FLASKS.—Put a coil of sheet zinc into the water in the vulcanizer and it will prevent the formation of much of the black oxids which form on iron flasks. After using a few times the flasks will soil the fingers but very little.—*Brit. Jour. Den. Sci.*

DANGEROUS PRECEDENT.—First Doctor—"What makes you think the patient will die if you don't perform the operation?" Second Doctor—"That isn't the point. This is a new disease, and if he should live without an operation it would establish a precedent."

SOUTHWESTERN (WASH.) DENTAL ASSOCIATION.—A society with this name was organized last month at Aberdeen, Wash., and the following officers were elected: Pres., S. C. Maker; V.-P., M. D. Coons; Secy., F. L. Nail; Treas., E. E. Lane; Trustees, W. J. Long.

UNLIMITED NERVE.—"Tut, tut," smiled the dentist. "That nerve does not reach up so far as you say. It is not a foot long at all. That's all in your mind." "Um-m-m-," groaned the writhing man; "it surely feels as if it were nearly all there."—*Atlanta Constitution*.

A. READ died Dec. 29, 1901. He was a native of Pennsylvania and began the practice of dentistry in this country, but had been a resident of Copenhagen, Denmark, since 1860. He was patronized and honored by the royal families of Denmark, Sweden and neighboring countries.

SALIVARY VOMIT.—Morning vomiting of nearly pure saliva is sometimes observed in subjects suffering from chronic alcoholic pharyngitis. It is distinguished by testing for potassium sulfocyanate with a weak solution of ferric chlorid, getting a blood-red coloration if positive.—*Ex.*

TO CLARIFY WAX.—Melt in hot water bath, then remove from water bath and bring to a slow boil on the stove. Into the boiling wax pour a fresh egg, and stir for three or four minutes till the egg is thoroughly cooked. Strain through a piece of cheesecloth, to remove all pieces of egg, and you will have your wax as clean and pure as when bought from the dental depot.—*Items of Interest*.

CONSTITUTION AND FLAG.—Physician—"You have a sound constitution, but you are overworked and a little run down. That is why your energies have begun to flag." Patient—"Then in my case the constitution does not follow the flag. I am glad to have that point cleared up."

MARRIED.—C. L. Blodgett, Yankton, S. D., Dec. 2; Harry Boysen, Dubuque, Ia., Dec. 25; John Davis, Moline, Ill., Dec. 25; J. W. Hicks, Bells, Tenn., Dec. 27; T. H. McKenzie, Three Oaks, Mich., Dec. 30; O. B. Smith, Waukegan, Ill., Dec. 18; Alvah Truby, Canton, O., Jan. 1, 1903; S. J. Zerfall, Mechanicsburg, Pa., Dec. 20.

TRI-CITY DENTAL SOCIETY held its annual election at Omaha, Neb., last month and elected the following officers: Pres., Harry Foster; V.-P., P. T. Barber; Secy., Z. B. Clark; Treas., H. J. Wallace. The society has prospered financially and numerically during the past year, and has increased its membership by fifteen new names.

POLISHING CROWNS.—To prevent marring a gold crown when polishing, wet the inside of the crown with soap solution, fill it with modeling composition, and while the latter is still soft thrust the end of a stick or instrument-handle into it. When the crown is finished soften the composition in warm water and remove.—*Dental Hints.*

STUDENTS CAN'T PULL TEETH.—The attorney general of Kansas last month handed down a decision to the effect that no one could practice dentistry in the state without holding a diploma from a dental college or a license from the state board of examiners, which action will bar students at college from practicing before they graduate.

NEW DENTAL JOURNAL.—We are in receipt of a copy of "*The Dental Era*," a new dental publication which comes from St. Louis. The editors are Drs. J. H. Kennerly and Herman Prinz. The sea of dental journalism is not an easy one in which to navigate, but we know no men in St. Louis more competent to start an enterprise of this kind than the two named. We heartily welcome "*The Dental Era*," and bespeak for it the kindly consideration of our readers.

VOICE LOST AS PENALTY.—According to newspaper report, L. L. Yonker, a dentist of Bowling Green, O., has lost his voice, and his friends insist that it is a direct manifestation of Providence. One evening the dentist and some friends were talking together when a discussion arose about the weather. One man predicted that the next day would be stormy, but Dr. Yonker disputed this and added that if it was stormy he hoped never to speak again. The next morning it was raining, and his voice had left him in the night.

AN INDIANA ROMANCE.—Paoli, Ind., has just been the scene of one of those little bucolic dramas that are peculiar to the Hoosier state, and it is worthy the pen of a Booth Tarkington. A dentist in the town wrote a letter to a comely young woman, telling her that he loved her. Inasmuch as he was a married man she determined to avenge the insult by horsewhipping him. The dentist, however, armed himself, and with a few of his friends barricaded his office. The damsel then rang the village fire-bell, and told the

story of her wrongs to the crowd which collected. The crowd thereupon gathered around the dentist's office and demanded that he come forth, which he finally did on promise that he should not be horsewhipped. The young woman made him read the letter aloud, confess that he had written it, and apologize publicly to her. Then the citizens told him to leave town at once, after which they dispersed, feeling that the honor of the city had been sustained. Who says that the age of chivalry is past?

AGE TOLD BY TEETH.—A young man in Chicago, age 22, was engaged to be married, but there was a "dark horse" in the race, a veterinary surgeon. One evening the two were at the home of the bride-elect, and a discussion arose as to the proper age when a man should marry. The "vet." declared that the teeth were a sure guide in the matter, so at the girl's solicitation he examined those of the prospective husband, and declared that he was much too young to be married. His fiancée thereupon threw him over, and the unfortunate victim of horse-play threatens to bring suit to recover damages for a broken heart.

ILLEGAL PRACTITIONERS.—The state dental boards have been making things lively since our last issue. Last month six men in Cleveland were indicted for practicing dentistry without a license; three in Toledo were each fined \$25 and costs for the same offense; two students at Nashville, Tenn., were indicted and arrested, papers were served on a man at Virden, Ill., and on another at Colorado Springs, Colo. An individual at Pontiac, Mich., was arrested for practicing dentistry without a license on the employes of various factories, and a dentist at Lebanon, Pa., on Jan. 6, 1902, was fined \$150 and costs for failure to hold a license.

FATALITIES.—A young woman at Gray's Lake, Ill., went to a dentist this month to have some teeth extracted. Chloroform was administered and the work was done, but the patient remained unconscious for three days and finally was revived just as her relatives were making the funeral arrangements. A man at Camden, N. J., died last month from blood-poisoning. The attending physicians claim that death was caused by the extraction of a tooth, which brought on the infection, but the dentists of the city are protesting vigorously, and state that the victim died from albuminuria. A man at Loyal, Wis., died last month from blood-poisoning arising from a fractured jaw, which was broken during the extraction of a third molar.

COLLECTION POSSIBLE.—In the December DIGEST, page 1054, we stated that a dentist in Iowa recently lost a suit which he brought to enforce payment for services, because it was discovered that he was not licensed and had therefore violated the law when he did the work. A similar case came up last month in Wisconsin, where a dentist was suing a patient to recover payment for services rendered. The defendant's attorney discovered that the dentist did not receive his license until three months after the work was done, and so he was practising dentistry unlawfully. The court held that the statute merely imposed a penalty for practising dentistry without a license, but did not prohibit recovery for services rendered, and he ruled further that the testimony was not permissible under the pleadings.

BITING THE FINGER NAILS.—Generally individuals who are addicted to this habit show symptoms of degeneracy. They present undergrowth, are slow, drowsy, unreliable, and have defective teeth. The treatment of onychophagia is indicated and requires careful observation on the part of parents and physicians; in many individuals painting the finger nails and the tissues around them with tincture quassia has brought good results. The extreme bitter taste of quassia prevents the child from putting the finger in the mouth, and in many instances we know a cure to have been effected.—*Med. Record.*

ACUTE SUPPURATIVE PERICHONDritis OF THE NASAL SEPTUM.—M. Lubinski describes two cases of this unusual affection. One patient was a boy of twelve and the other a middle-aged woman. In the one case no cause for the trouble could be found, while in the other it was ascribed to the large number of carious teeth in the patient's upper jaw. In both the symptoms consisted of swelling and tenderness of the entire organ, with the development of an acutely sensitive tumor of the septum. In each instance relief was afforded by ample incision and drainage with curetting, though the septum was left sufficiently damaged to produce marked flattening of the member with sinking in of its dorsum.—*Deut. Med. Woch.*

THIRD DENTITION WITH A VENGEANCE.—An individual styling himself "Dentist" has sent the following report to a leading English newspaper: "An old lady of seventy years had been toothless for many years, wearing a full set above and below. Recently she complained of her gums being painful, and upon examination I found that she was cutting a new set of teeth. In a short time she cut entire new dentures above and below and the teeth all seemed to be sound and firm. The strangest thing of all was that one of the new teeth had a gold filling in it. In a molar on the lower left side a piece of gold about as big as a match head was found roughly but solidly imbedded in the crust of the tooth. The only explanation was that the lady several years ago swallowed a gold filling which came out of her second set of teeth, and it worked around in her body until it came out in the remarkable manner indicated." Verily, truth is stranger than fiction.

ACID-FAST BACILLI IN GANGRENE.—Alberto Folli writes of a pseudo-tubercular bacillus whose presence under certain conditions may cause diagnostic errors. Frankel, Pappenheim, Rabinowitsch and others have found these bacilli in cases of pulmonary gangrene. Laabs found them in deposits on the teeth, Moller in the sputum in a case of simple bronchial catarrh, Dietrich in a suppurating ovarian cyst, Karlinski in the nasal secretion in a case of tertiary syphilis. The writer himself found them a few years ago in the sputum of a youth who died presumably from tuberculosis. At the autopsy gangrene of the lung was found, but no trace of tuberculosis. He reports three recent cases of gangrene in which acid-resisting pseudo-tubercular bacilli were found. The bacilli were not alike in every case, but were alike in resisting the decolorizing power of acids. The author does not deny the possibility of a cure of tuberculosis, but he thinks that in many cases diag-

nosed as such the presence of these bacilli may have led to error.—*La Riforma Medica*.

REVOCATION OF LICENSE TO PRACTICE.—The Court of Appeals of Kentucky recently decided, in *Matthews vs. Murphy*, that the State Board of Health had no right to revoke a physician's license for unprofessional conduct, not because such a right might not be made legal by proper legislation, but because it had not been. The court held, and we believe very justly, that the changing opinions of different boards as to what constituted unprofessional conduct in any given case were too uncertain a factor to jeopardize a man's legally acquired right to practice his profession. It held that the statute which gave the board the power of revocation should have specified the acts that such board could decide to be unprofessional and detrimental to the public interest by virtue of them stamping their perpetrator as a man unfit to be trusted with the responsibilities of the health and life of individuals.—*Med. Council*.



JOSHUA WAYBACK.—"Automobeel, wuz it? I thought it wuz a hoss wagin goin' back end to, and this is th' fust I know sence!"

NAVY DENTAL BILL.—A bill to add dental surgeons to the medical corps of the navy was introduced January 8, 1902, by Mr. Pettus, in the Senate of the United States, and was read twice and referred to the Committee on Naval Affairs. The bill is numbered S. 2519, and is as follows: "*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that to the medical corps of the navy there shall be attached a corps of dental surgeons to serve the officers, enlisted men, and boys in the naval military service and training schools, which corps shall not exceed in number the proportion of one to one thousand and authorized by law for said service and schools.*"

"The said dental corps shall consist of three grades, designated assistant dental surgeon, passed assistant dental surgeon, and dental surgeon, and with respect to rank, pay and allowances and to promotion within said dental corps, the grades named shall correspond to the grades of the Medical Corps designated assistant surgeon, passed assistant surgeon, and surgeon, respectively.

"Sec. 2. That original appointments shall be made to the grade of assistant dental surgeon and the appointees must be citizens of the United States, between twenty-three and thirty-three years of age, graduates of standard dental colleges, with not less than two years' subsequent experience in practice, of good moral character, of unquestionable professional repute, and shall be required to pass a satisfactory physical and professional examination: *Provided*, That there shall first be selected a member of the dental profession who is a graduate of a standard dental college and whose aptitude and experience evidence eminent fitness for conducting the professional examinations herein provided for, and for otherwise assisting in organizing, equipping, and supervising the operations of the corps, who shall be first appointed to the grade of dental surgeon."

PRURITUS SENILIS LINGUÆ.—E. Baumgarten describes a case of senile pruritus, which first manifested itself in the tongue and was treated without relief for some time before the true nature of the trouble became evident through the occurrence of itching elsewhere. This condition is so rare that the diagnosis is justifiable only after all other possibilities have been inquired into and excluded. There are many systemic conditions capable of producing subjective symptoms in the tongue without visible lesion, but nearly all of these may be relieved by appropriate treatment, while true pruritus is not amenable to remedial measures. The more important of such causal conditions are affections of the stomach, intestines, liver, kidney, and spleen, all circulatory disturbances, and trouble with the pelvic viscera, especially in women about the climacteric.—*Muench. Med. Woch.*

BLOOD CHANGES INDUCED BY THE ADMINISTRATION OF ETHER AS AN ANESTHETIC.—J. C. DaCosta and F. J. Kalteyer draw the following conclusions: (1) The number of red corpuscles is influenced by many factors associated with and accompanying the anesthetic state. The character of this change is, as a rule, a polycythemia; rarely, an oligocythemia. (2) The nature of this polycythemia seems best explained by a lessening of the watery elements of the plasma, thereby reducing the total volume of the liquor sanguinis, and consequently causing concentration of the blood. (3) The three important factors incident to the polycythemia are: (a) The period of preparatory operative treatment; (b) the anesthetic state; and (c) the postoperative stage. (4) The blood inspissation is, as a rule, most pronounced immediately after the termination of the anesthetic stage. (5) The hemoglobin is always reduced absolutely; in some instances there is an apparent increase, but this rise in the percentage of hemoglobin is never parallel with the rise in the number of red blood cells. The individual corpuscular hemoglobin value is therefore reduced. (6) The duration of the anesthetic state and the amount of ether may influence the blood changes; but the extent of the disturbance could not be determined on account of the many modifying factors. (7) The amount of hemorrhage does not seem to affect the composition of the blood. (8) On account of the hemolysis, which is shown by the fall in corpuscular hemoglobin after operation, a very low percentage of hemoglobin must be regarded as a contraindication to the administration of a general anesthetic. Below fifty per cent is a dangerous level.

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Original Contributions.

RECURRENCE OF CARIES UNDER GOOD FILLINGS.

By H. A. SMITH, D.D.S., CINCINNATI. READ BEFORE THE CINCINNATI ODONTOLOGICAL SOCIETY, MAY 31, 1901.

We have heard much the past few years of the proper preparation of cavities in relation to their enamel margins. As a result of these studies in "extension for prevention" interest has been revived in the question of recurrent caries away from the margin in the bottoms of cavities that have been well filled with gold or other permanent filling material.

A notable paper bearing on the subject was read before the International Dental Congress in Paris last year by J. Choquet, Professor in the Dental School of Paris. The main purpose of the paper, the author stated, was the study of the etiology of dental caries, in relation to the recurrence of decay under carefully inserted fillings in thoroughly cleansed and properly prepared cavities.

This statement brings up the question of proper cavity preparation, at least so far as the removal of softened or carious dentin is concerned. Before the establishment of the germ theory of dental caries, it was the practice with thorough operators to remove all traces of softened or discolored dentin, even at the expense of pulp exposure. Dentists of this school believed an exposed pulp carefully capped was not so liable to give after-trouble as one over which a covering of partially decalcified dentin was left. At the present time there is apparently no hesitation about leaving a layer of infected dentin over the pulp, reliance being placed upon antiseptics for complete sterilization of the infected layer. That the hasty methods now in vogue for sterilization of cavities should result in frequent failure is to be expected.

It is usual to assume that in the zone of infected dentin the bacteria are arranged in platoons in alignment, when the actual condition is that the advanced guards or pickets, so to speak, are far in

advance of the main army of invasion. Sterilization would be comparatively easy if the bacteria were massed; the real difficulty is our inability to reach with our antiseptics the collection of bacteria in single tubuli beyond the so-called second layer in the carious process. Frequently in our antiseptic treatment these microorganisms have not been disturbed in the least in their habitat; they still live, proliferate and excrete lactic acid. Quoting Prof. Choquet, who believes, as do also Galippe and Miller, that "notwithstanding all the care used in the preparation of a cavity and the subsequent filling we can never affirm there will not be a recurrence of decay." There is no other explanation he thinks of for those cases in which fillings have been inserted for five, ten, fifteen, or even twenty years, about the walls of which no leakage has occurred, and yet under these fillings is found softened or discolored dentin which in time will cause the destruction of the pulp. It is necessary to admit in such cases that the cause is an internal one, and that it has developed as the consequence of the presence of certain microorganisms in the tubuli of a kind of dentin which appears to the eye and touch healthy.

In order to study the morphological and functional changes that occur in bacteria of caries found under fillings that have been placed for several years, Choquet instituted a series of experiments of inoculation. From three perfectly filled teeth he succeeded in isolating five species of microorganisms. A pure culture was obtained from one of these teeth—a lower molar which had been filled for seven years on the buccal surface, and which was extracted to prevent trouble accompanying the difficult eruption of a third molar. Choquet describes this species as a bacillus of slow development with a tendency to grow best without the presence of oxygen. With a pure culture of this bacteria he proceeded to produce dental caries in living animals. Heretofore all attempts to produce artificial caries have been upon teeth out of the mouth, and notwithstanding that specimens of artificial caries have been frequently shown by Miller and others that could not be distinguished from natural caries, there have all along been those who rejected the chemico-microbic theory of dental caries, because the specimens experimented with lacked the life element. The late Doctor Atkinson said "There is no one of those cases that cannot be discerned in an instant as to which is natural and which is artificial."

In these experiments of inoculation the sheep was selected because of the docility of the animal, and also the resemblance of the animal's anterior teeth to the human incisors. One of these experiments Choquet describes—a cavity was carefully made in the labial surface of a central incisor 3MM in depth. A small drop of bouillon which had been inoculated twenty-four hours with the pure culture was deposited in the bottom of the cavity and covered with a thin platinum cup. The cavity was then filled with cement. All precautions were observed throughout the operation to maintain an aseptic condition. Nine months afterwards the animal was slaughtered and the following phenomena were observed: "The dentin, instead of being white as it normally is, was of a yellowish hue and was also softened. The softening, reaching a slight depth, was very plain and more noticeable at the portion of the cavity where the diameter had increased." A small portion of this softened dentin was removed, and on inoculating the same kind of media as originally used the same species used for the original inoculation was recognized. "Thus was demonstrated the possibility of producing artificial caries in a living animal."

It will be seen that these investigations of Choquet are unique and a study of them in detail as given in the original paper cannot fail to be useful to the dentist in his everyday practice. I will briefly relate a case which occurred recently in my own practice in which Choquet's investigations and conclusions were especially helpful in diagnosis. The case was one of obscure facial neuralgia. The patient, twenty-five years of age, seemingly in the best of health, applied to be relieved of pain of an intermittent character which she thought might be associated with some lesion of the teeth. A careful examination of the teeth on the side affected showed three superficial cavities, and these I at once filled permanently. An approximal, somewhat deep-seated cavity for prudential reasons I filled with gutta-percha. Believing the pain was not due to pulp irritation by reason of these cavities, I prescribed quinin in tonic doses, two grains three times a day for six days. The paroxysms were not so frequent and the pain was less severe during the quinin treatment. In a few days, however, severe intermittent pains returned. At this stage of the case my attention was centered upon a lower second molar which had been filled on the occlusal surface with gold five or six years before. The character of the

filling was excellent, and notwithstanding that there was not the slightest evidence of recurrent caries about the margins of the cavity, I decided to remove the filling to see if there was not recurrent caries under it. I found the cavity of medium depth and the dentin in the bottom for two-thirds its extent was hard and natural in color; the remaining one-third in a labial direction was softened and slightly discolored, thus clearly showing the presence of dental caries. I found the disease had advanced lingually under the hard area I have mentioned. The pulp was not exposed. Carefully removing the softened dentin down to a layer sufficient for pulp protection, I applied antiseptic treatment. Oil of cloves and carbolic acid in the proportion of three to one were used. Two dressings were made in seven or eight days, care being taken to seal in each. The cavity within the cavity was then filled with the softer variety of gutta-percha, care being used to avoid pressure on the pulp. After using a cavity varnish the main cavity was filled with oxyphosphate. Now after a lapse of several weeks all neuralgic pains have disappeared. The tooth when last seen responded to the tests for a living pulp.

It being granted in this case that the original filling hermetically sealed the cavity, that there was no negligence in its preparation, and that the usual custom of wiping the cavity with an antiseptic was observed, we naturally conclude that recurrent caries was due to intertubular infection such as I have described. Upon this hypothesis it took five years after the filling was inserted for caries to advance sufficiently near the pulp to cause disturbance. The phenomena observed in the case I have related tends to confirm Choquet's conclusion that "the destructive process of caries may take place under good fillings of whatever material after the lapse of a long time."

The paper which suggested the title of my own, and from which I have quoted, was one of the two or three which were read before the Paris Congress that attracted special attention. I would earnestly recommend it for careful study. I am aware the thoughtless dentist will say it is too scientific and ask of what practical benefit is all this? In answer I beg to remind him—The successful *practice* of dentistry is always based on the *science* of dentistry.

[Dr. Choquet's paper will be reprinted in full in the March DIGEST.—Ed.]

Discussion. *Dr. J. R. Callahan:* It is almost impossible to sterilize the substance within the pulp-chamber, and in those cavities where we leave decay I am sure the infection reaches clear to the pulp. The preparation of the cavity is of really more importance than the filling.

Dr. J. S. Cassidy: I should name this paper "The Failure of Good Fillings." Otherwise we might suppose the failure was due to some defect in the preparation of the cavity. As it is, we must suppose the cavity properly prepared, all infected matter removed, and the cavity properly filled. Further, we must restrict ourselves to destructive influences that would bring about decay. These are in the nature of possibilities of attack proceeding from outside the filling itself. We have suggested that recurring caries may come on the surface of fillings as well as under them. In caries proceeding from the surface near the filling we have conditions which must be considered similar to those existing before the teeth decayed at all, but we have in connection with that condition the presence of the foreign body—the filling. If these fillings be foreign in their physical properties—amalgam and gold—we must note that the difference between the two substances and the potentiality in specific heat and other innate properties figure in recurring caries. We do not see decay recurring as a rule on the surfaces of non-metallic fillings. The combining of amalgam and gold in a filling results in the immediate polarizing of the two metals, which is unfavorable to the recurrence of caries. It occurs to me that neurasthenia may influence decay of the teeth. If through nervous perversion such phenomena as absorption of tissues may result, with an accompaniment of excretion of lactic acid, why may not the same thing occur in the pulp of the teeth, the accompanying generation of lactic acid accounting for the recurrence internally of caries under even a perfect filling.

Dr. O. N. Heise: This last suggestion is certainly novel, and perhaps Dr. Cassidy has made a new discovery. We are taught that the pulp is capable of throwing out secondary dentin, so why may it not secrete lactic acid. I fear, however, that if this theory should be substantiated it would discourage care in filling teeth. Dr. Choquet, a French investigator along lines similar to those suggested by Dr. Smith's paper, made experiments to show decay spontaneously reasserting itself under circumstances much like

those given in the paper. From the details which he gives, however, I am inclined to think that he did not conform closely enough to the conditions laid down to entitle his conclusions to serious consideration. With a cavity carefully excavated and filled I do not think internal decay can occur.

Dr. H. A. Smith: If I intimated that there is no therapeutic value in the filling material I went too far. Dr. Miller's experiments show that copper amalgam prevents to a great extent the growth of microorganisms, but the same is not true of cohesive gold. The theory I have advanced to account for recurrence of decay under perfect fillings finds its analogue in the cases of plants transferred from a tropical to a temperate zone. They may continue to grow, but not luxuriantly, and the microorganisms in the dentin of the teeth develop very slowly indeed, but still they develop. We arrest decay but we do not prevent it.

NITROUS OXID IN EXTRACTION.

BY W. A. RODDY, D.D.S., ST. LOUIS, MO. READ BEFORE THE ST. LOUIS DENTAL SOCIETY, MAY 7, 1901.

You will find my paper in three divisions—1st, Nitrous Oxid, the forerunner of anesthesia and by whom discovered. 2d, The manner in which gas is made and used. 3d, Its effect on patients.

Nitrous Oxid the Forerunner of Anesthesia and by whom Discovered.—The impression long existed that there must be in nature a means to paralyze the nerves of sensation, to alleviate pain in surgical operation, but it was thought this must be done through the medium of the stomach. Sir Humphrey Davy, the discoverer of nitrous oxid gas, first ascertained that it could be inhaled with impunity, and noticed its effect on the human system, producing exhilarating effects and a species of insensibility similar to intoxication, and went so far as to suggest that it might perhaps be used to alleviate pain in some minor operations. From that time no advance was made toward anesthesia, and no further use was made of nitrous oxid beyond illustrating its exhilarating effects upon the human system before classes and assemblies, until December 10, 1844, which may properly be called the natal day of anesthesia. On that day Dr. G. Q. Colton, while delivering a chemical lecture in the city of Hartford, Conn., for the entertainment of his audience was illustrating the effect of nitrous oxid on the human system by

administering it to ladies and gentlemen on the stage. Among them on the platform was Dr. Horace Wells, a prominent dentist. During this exhibition a young man became unusually excited and performed sundry evolutions and gyrations during which he badly contused and abraded his shins by collisions with the benches. In answer to Dr. Wells' inquiry, he said he was not conscious of any injury. After consulting Dr. Colton about it and other incidents of like character, Dr. Wells determined to test the matter by having a tooth extracted for himself. Accordingly Dr. Colton carried a bag of the gas to Dr. Wells' office and administered the gas to him, and Dr. Wells' assistant, Dr. Riggs, extracted a large molar tooth. On recovering, Dr. Wells exclaimed, "New era in tooth-pulling, didn't hurt so much as a prick of a pin." This was the first operation that was ever performed with an anesthetic.

Dr. Wells determined immediately to use the gas in his practice, and at his solicitation Dr. Colton provided him with the apparatus and taught him how to make it—not the simple matter of distilling nitrate of ammonia as to-day, but a laborious process of neutralizing nitric acid with carbonate of ammonia and slowly evaporating in a porcelain vessel, when it must be distilled and washed. Dr. Colton also instructed him how to administer the gas and furnished the necessary appliances. Dr. Wells began its successful use in his practice, giving the gas to hundreds of people, other dentists bringing their patients to his office, until ill health caused him to relinquish it. On August 17, 1847, Dr. Wells administered gas for the first time in a surgical operation, removing a large scirrhus testicle; January 1, 1848, for a thigh amputation; January 4 for the removal of a large tumor. All the operations were entirely successful—no pain or unpleasant feeling being experienced. It might be added that Dr. Wells experimented with vapor of ether and extracted some teeth with its use, but not finding the results as satisfactory as with the gas discarded it.

Two years later Dr. W. T. Morton, a Boston dentist who had been a student in Dr. Wells' office, visited Hartford and found all his old friends telling of Dr. Wells' success in extracting teeth without pain with the nitrous oxid gas. He was at once interested and applied to Dr. Wells for a bag of gas to take to Boston with him. Dr. Wells suggested how cumbersome it was, and advised him to apply to Dr. Charles T. Jackson, a distinguished chemist connected

with Boston Medical School, for instruction how to make and use gas. When approached, Dr. Jackson listened and exclaimed: "Nitrous oxid exhilarates, ether exhilarates—if gas will kill pain, ether will" ; and told him ether was a liquid he could get at any drug store, and he could breathe the vapor off a handkerchief. So Morton got a bottle of ether and gave a bootblack 50 cents to inhale some, then whipped out his knife and slashed it into the boy's thumb. This was the first experiment with any other agent than nitrous oxid, and after conference with Dr. Jackson on September 30, 1846, he administered ether and extracted a tooth for Mr. Ebon Frost, it being their first operation with ether as an anesthetic. It may be added that this was more than a year later than Dr. Wells' experiment with it, but Drs. Morton and Jackson immediately applied for a patent on anesthesia and began the attempt to sell dentists office rights to use it, but soon Dr. Jackson, who was superethical, became ashamed of being mixed up with a patent, sent a request to the Commissioner of Patents that the patent be issued to Morton alone, and they had a clear road.

Wells died, and nitrous oxid as an anesthetic slumbered until the summer of 1863, when Dr. Colton was again at Hartford and vicinity lecturing. At New Britain he mentioned Dr. Wells' success with nitrous oxid and several were eager to try it, so arrangements were made with Dr. Dunham and their teeth were extracted. Dr. Colton then instructed Dr. Dunham how to make and use the gas, and went to New Haven, where he mentioned in his lecture the success in Hartford and New Britain and announced that he would be at the office of Dr. Smith to accommodate those who might desire to avail themselves of the use of the nitrous oxid. He remained with Dr. Smith one month, during which time they extracted 1785 teeth. This was the revival of nitrous oxid. The matter came to the ears of the famous showman, P. T. Barnum, and at his suggestion the Colton Dental Association was formed, consisting of Dr. G. Q. Colton, P. T. Barnum and Dr. John Allen, the inventor of continuous gum teeth. The Association established branch offices in all the large cities.

The Manner in which Gas is Made and Used.—In order to have perfectly pure gas, first see that the apparatus you use is in perfect condition; then test the ammonia by taking half tumbler of water, put one teaspoonful of ammonia in glass of water, and if the water

becomes milky it will not do to use. After procuring pure ammonia, place two to three pounds of ammonia salt in the glass flask, then apply heat. Great care should be taken to guard against excessive and irregular heat. Ammonia salt melts at about 230 degrees; at 396 degrees it begins to decompose into nitrous oxid and water, yielding 36 parts water and 44 parts gas. When the heat is allowed to rise much higher than this point deleterious compounds form with the nitrous oxid, which if allowed to any considerable extent may prove fatal to health and life. When at the proper heat, that is, when melted, make the connection with the water bottles, having at least three bottles, one to contain caustic potash to destroy all impurities. Allow the gas to flow through the bottles into a tank of water, where it should stand from six to fourteen hours before being used, the water taking up the impurities. I prefer gas from twenty hours to three days old, for while it takes more gas to get the patient completely under the influence, the after effects are better, not leaving the patient with headache or nausea. The fresh gas has a longer effect than the older, so when there are a number of teeth to extract I use the fresh gas. I use an inhaler which does not have a rubber cup to cover the face and frighten children, or even grown people. I do not use the rubber bag for measuring the amount of gas to be given, but take it direct from the tank, using my own judgment as to when I can begin to operate, by lifting the hand, or watching the eyes, or moving the head to see if the muscles have relaxed, and by the breathing. I have used gas on persons of all ages, from three and one-half to seventy years for extraction of teeth and have found but few cases where it could not be employed. Not long since a physician came in my office with a patient who was suffering with a "bone felon." While he scraped the bone I administered gas and kept her under the influence five minutes with no bad results whatever.

Its Effect on Patients.—If there are any bad results after taking gas, I use spirits of ammonia. I have never had any serious trouble, and believe when pure gas is given by one who knows how to use it there will be none. By having the patient take a long, deep breath anesthesia will be produced much quicker than by short breaths. The difficulty in putting a patient completely under the influence of gas is caused by a leakage of the valves in the mouth-piece, or the lips may become loosened around the mouth-piece.

Especially is this the case with a man who has a short, stubby beard, or on a hot day when the lips or fingers in holding the lips to the mouth-piece perspire. In cases where there are more teeth than can be extracted with one administration, I wait from 10 to 15 minutes before the second administration. The general impression is that gas should not be given to fleshy people when the vital forces are below normal, or to intemperate people and consumptives, but I have given it to all kinds and classes and have never had the least trouble. I am firm in the belief that when one is suffering from heart trouble the shock to the system is greater in extracting a tooth without gas than with it.

DENTISTRY AS A SPECIALTY OF MEDICINE.

BY DR. O. N. HEISE, M.D., D.D.S., CINCINNATI. READ BEFORE THE CINCINNATI ODONTOLOGICAL SOCIETY, MARCH 29, 1901.

The subject for consideration to night is one which has been agitated not only by the dental profession but by medical men as well. Some months ago a symposium on dental education was held at the meeting of the American Medical Association, and I cannot do better than to quote from an editorial in the *Journal of the American Medical Association* for June 16, 1900, on this subject. "Medical educators will be deeply interested in the symposium on dental education held by the Section on Stomatology at the Atlantic City meeting of the Association. This symposium deals with every phase of the subject. The paper by Dr. N. S. Davis has special interest, and that the views therein, which were advanced more than four decades ago, are of more value to-day than when first expressed is shown in the later discussions of the same topics by others. On perusal of these papers it will be generally admitted that advanced education is necessary for the successful practitioner of stomatology at the present time. This idea is gaining ground among dentists, and the term for their science is an evidence of the advanced conception held to-day by many dental societies of the status of dentistry as a specialty of medicine. As shown by this term, the dentist has ceased to be a mere tooth-carpenter and has become a medical scientist. Dental science has brought diseases of the mouth, jaws and teeth so obviously under the domain of general pathology that somatic problems elsewhere presented are best and most easily studied in the mouth. This is particularly true of teratology,

embryology, excessive and arrested development, especially as related to race advancement and degeneracy, as has been shown by Talbot. Factors of acquired degeneracy, like the drug habit, mercurialization, etc., neurotrophic and diathetic states, have nearly all their pathologic phases outlined in the interstitial gingivitis. (Talbot.) To enable the dental student to successfully treat these lesions he should have a broad training in the fundamental branches of medicine, such as anatomy, physiology, pathology, bacteriology, materia medica and chemistry. It will not do to have these sciences taught in the dental school, even by the same teachers, because a student acquires the idea that they are not necessary to a successful practitioner of dentistry. Dentistry as practiced to-day by the better element is a part of general medicine. The same requirements should be exacted for the entrance of the dental student as for the medical. They should be taught in the same class and in the same manner. The first examination should be as exacting for one as for the other, and no distinction should be made between them."

Not long ago Dr. C. M. Wright read an excellent paper on "Outline and Detail Medical Study" which pleased me greatly, as I thought he had always opposed the idea of dentistry broadening out and becoming a pure specialty of medicine, which it must do in order to fulfill his prediction that "the prescription pad and systemic remedies will be as potent weapons in the hands of the dentist in the future as are digital dexterity and instruments to-day." I might mention in passing that Dr. F. A. Hunter, who for years has been opposed to this idea of broadening dentistry, now admits that it is only a question of time when all dentists will be medical graduates. He thinks it will not be in the near future, however, and I do not believe it to be close at hand, because the college element of our profession will hinder its rapid development, partly on account of the financial conditions involved as affecting those in control of the colleges, especially the independent ones, and also for the reason that you cannot change those opinions and ideas for which men have worked for many years. It is the nature of man to cling to the thoughts handed down to him—"That which one age tells to another seems to men truth fundamental." The thralldom of the age to tradition is peculiar, but we have at the present time outgrown it to a large extent. Think, however, of the time when William Harvey discovered the circulation of the blood. He was

accounted crazy, his practice declined, and a pack of "barking dogs," as he called them, was soon at his heels. "Would you have us believe that you know something that Aristotle did not know?" demanded one adversary, Dr. Primrose, adding, "Aristotle observed everything, and no one should dare to contradict him." The voice of Primrose was the voice of the age. No man over forty accepted Harvey's ideas, and half a century later the medical faculty at Paris petitioned the king to prohibit the teaching of the circulation, as a doctrine contrary to the authority of Aristotle. The same treatment has been accorded every new idea or invention. When railroads were first constructed the doctors of Bavaria declared that they would cause the greatest deterioration in the health of the people, because such rapid movement would cause brain trouble among travelers and vertigo among those who looked at moving trains.

That the dentist should have a thorough medical training is in my mind a settled fact, and it seems to me that it cannot be obtained in the average dental college. Why should not the student acquire his knowledge of medicine at the fountain head, from men who have studied these branches more thoroughly than any dentist would or has the opportunity to do? Where also he can have the advantage of practical laboratory courses of instruction in all the various branches, which the dental college does not give. Again, the hospital instruction and clinical work are of paramount importance in giving broader ideas than he can get from spending all his time in the dental clinic. The chair of oral surgery gives the dental student an opportunity to witness operations other than the strictly dental ones, but he should see more than a few such operations during the year. He should obtain a knowledge of general medicine, not from books alone but by clinical instruction as well.

One of the foremost rhinologists and laryngologists in this country recently said, "The demonstration of the important relation of general medicine to dentistry, which is being shown by a number of scientific articles, is a neglected field. The relation of facial contour and the upper arch to nasal breathing in early childhood cannot be overestimated, in fact, it is nasal breathing which controls the regular development of the facial bones and especially the superior maxilla. A thin alveolar process in the upper jaw, from lesions of the teeth, may cause by extension of inflammation, by continuity of

structure, lesions of the floor of the nose or of the antrum; or, on the other hand, deflections of the septum or spurs situated close to the floor of the nose, by the inflammatory action set up on the surrounding structure, may bring about inflammation and diseased condition of the teeth in direct line of obstruction. The stomatologist should have a thorough knowledge, not only of the nasal cavities and accessory sinuses, but also of general medicine, and, indeed, a general practitioner or specialist should have a more thorough knowledge of stomatology."

The administration of anesthetics, the injection of cocain, etc., as ordinarily done by the dentist is likely to bring discredit upon the profession. Patients are given nitrous oxid gas when the dentist has no idea of their general condition. In fact, is the average dentist equipped to ascertain even in a general way the condition of the heart, lungs, kidneys, etc., and in case of any serious trouble during the administration is he qualified to take care of the patient? Does he not invariably call in a physician instead of a brother dentist, thereby acknowledging that we as dentists are not competent to undertake cases where life is at stake. What would be the criticism in a fatal case where no physician was called? Would it be the same if the accident or fatality occurred at the hands of an oculist, aurist, rhinologist, laryngologist, or any other medical specialist, who had not called in medical aid? We know that the dentist would be censured, in fact, it has even been suggested in certain quarters that dentists should be prohibited from giving anesthetics except in the presence of a physician. Other countries, like France, will not allow American dentists to administer anesthetics, or even inject cocain, etc., unless they have complied with the French law regarding dental education, as over there they require a better medical training than our dental colleges give. While I was in Paris last summer this was told me by an Ann Arbor dental graduate. He had intended to begin practice in Paris, but before he could do so he had to spend some two years in study and in attendance upon one of the dental colleges. At first he considered this a hardship and an injustice, as he felt capable of undertaking any dental operation as well as any French dentist, but when the ordeal was past he realized the deficiency of our method of giving only theoretical medical training in the dental schools.

Some men, like Dr. James Truman and others, advance the idea

that "in proportion as we aspire to build up our curriculum so as to produce M.D's., just in that proportion will dentistry deteriorate." This is in line with the ideas held by the past generation of business men, that boys who had a high-school or university education did not make good business men, as such education prevented a thorough training in business, the early and adaptable years being consumed in acquiring knowledge which could not be used afterwards. The facts are, however, that the leaders in business enterprises to-day are men of broad and liberal education, and where it was not obtained in college it has been acquired by self-education in after years, showing that these men felt the need of it. It is a common thing to-day to see graduates of universities enter business houses and, owing to their superior mental training, master the details of the work in a short time, where failure would have resulted without the trained mind. Those dentists who object to a medical training for the dental student do not understand nor appreciate the full scope and importance of our profession. Those men who are satisfied with [filling teeth and making plates are like the simple-hearted ancient geographers who wrote on their maps of the world, besides the columns of Hercules (representing the Straits of Gibraltar), "Here ends the world."

One of the principal objections urged against this broadening of our education, or as Dr. Wright puts it, "The bringing up of our outline work," is that the dentist thereby loses in fingercraft or dexterity of manipulation, that he becomes too theoretical and not practical enough. I fail to see why he should become less expert on account of being better equipped mentally, for in the very act of obtaining the desired knowledge he is required to do considerable work with his fingers, and the laboratory courses demand much manipulative ability. We see the result of such study in the men who take up the various specialties of medicine. Look at the oculist, aurist, the general and special surgeon, in their various fields of work—are they any less expert in their operations or handling of instruments than is the dentist? Many of them will outstrip him in skill and dexterity. Consequently, it seems to me that a thorough scientific medical training does not detract one iota from a dentist's manual dexterity.

Discussion. *Dr. C. M. Wright:* When we treat an exposed pulp, an abscess, a case of pyorrhea, or any lesion of the parts

closely related to the teeth, we are practicing a specialty of medicine in as strict a sense as does any other specialist. So much must be conceded, whether we accept or reject the dictum that dentistry is a specialty of medicine. During the last thirty years a decided change has taken place in dental practice. Who at that time treated pyorrhea? The majority of dentists then extracted all so-called ulcerated teeth. When a few thoughtful, progressive men began to treat these affections they were unconsciously but none the less certainly taking the first steps towards establishing dentistry as a specialty of medicine. If we have any real ambition to be recognized as part of the great medical body we can attribute our failure to have already attained that end to our custom of basing our estimate of each other on the ability to fill teeth, treat abscesses, make dentures, etc., and to the common fault of openly detracting from one another's skill as a dentist by such statements as "He is a poor operator and plate-worker," etc. I think we are not specialists in medicine because the principles of practice in medicine and in dentistry are radically different. While I in a way agree with Dr. Heise that dentists should have a more liberal medical education, and trust the profession will come up to the standard he sets, I say the greatest drawback to the realization of such a hope is in the present failure of the rank and file to recognize the necessity of the step. If any one of us should give up the filling of teeth and everything that pertains to the purely mechanical nature of our services, and devote himself solely to treating oral lesions, he would then become a medical specialist within our own lines.

Dr. F. A. Hunter: I do not believe the dentist is any better as a dentist for having the medical degree, and the leaders of our profession to-day are those who do not hold it. At present we are a separate and distinct profession, having our own colleges, literature, methods and aims in the nature and substance of what is taught the students. The time may come when the medical degree will be required of the dental matriculate, but I doubt whether that time is near at hand. I furthermore question the correctness of Dr. Heise's assumption that anatomy, physiology, therapeutics and allied subjects are any more readily assimilated by the dental student in a medical college than by the same student under the teachings of a medical professor in a dental college. Why should they be? Of course it is obvious that the dentist often verges on the borderland

of medicine and sometimes actually practices it, but for all that the practice of dentistry is so essentially different in most respects from that of medicine that they may be said to have very little in common. The relationship of the two is not of sufficient importance to make it incumbent upon the dentist to qualify himself as a physician. I have said that generally we as dentists are not regarded as medical specialists. In hiring the dentist under contract the United States government recognizes him merely as a laborer, and he has no rank as an officer as has the army surgeon.

Dr. W. M. Williams: I thoroughly approve of the advanced position Dr. Heise takes in his paper, and I have always advocated raising the standard of dentistry as high as possible, on the principle that what we claim for ourselves the public will ultimately accord us. Dr. Hunter puts the matter in an unnecessarily harsh light in using the word "laborer." In both the army and navy the government employs surgeons and physicians under the same conditions of contract, and no one regards it as a reflection on the medical profession. To be sure, the army and navy have also other surgeons who hold the regular title and rank of officers, to which the dentist has no chance of attaining, but the regular officers have always opposed the conferring of any army or navy titles on surgeons or physicians, so the dentist is no more humiliated than the surgeon has always been. Furthermore, the dentist has only recently been admitted to either branch of the service, and we have sufficient ground for congratulation that so much has been achieved, without endeavoring to detract from the honor of the recognition which our profession has received from the government.

Dr. H. T. Smith: I do not accept Dr. Heise's statement that throat, nose, eye, ear and other specialists have digital dexterity and skill equal or superior to that of the trained dentist, for the average dental operator would easily take precedence over the average operator in any medical specialty. It has been asked whether even the making of a bridge does not depend on a certain anatomical preparation of the teeth which may be characterized as belonging to medical science. This might be conceded as a matter not particularly significant in its bearing on the question. Dr. Heise assumes that the dental student is not well grounded nor ordinarily interested in pathology, histology and other branches which receive much attention in the medical school, but this is a mistake, and the dental

student is as likely to be deeply interested in these subjects as is the medical matriculate. One thing which would militate against having the dental student first take the medical degree is, that it would in most cases postpone his entrance into the dental college until the twenty-fourth or twenty-fifth year, and at that age the ability to acquire finger-craft is not so great as earlier in life.

Dr. J. R. Callahan: In the main I heartily endorse Dr. Heise's views, and I have always regretted that I did not take a full medical course before entering the dental college. The question may be asked why dentists were not long ago appointed to the army, and I believe it is because of the estimate which they placed on themselves and because of the opinion of the dental profession which they have caused to go throughout the world. Another thing which has exerted its influence against us is the fact that a large number of dentists have received the honorary "M.D." title, but very few have actually taken the hospital course.

Dr. F. W. Sage: I am distinctly in favor of anything which makes for the better equipment of the dentist and the elevation of the profession, but I must still maintain that dentistry is *sui generis* and that it cannot be merged into the medical profession because it ministers to its patients in a wholly different way, which is largely mechanical. The question is not entirely what we would like to be, but what our patients wish us to be. I will go further than Dr. Hunter and say that some of the most brilliant men in the history of the dental profession were incapable of profiting by a medical education. They were so distinctly mechanical in the quality of genius they displayed that they could never become interested in the generality of the subjects which engages the medical student. Nevertheless, they served their patients well and were esteemed peerless as dentists. At the present day men with meager attainments in medical knowledge are serving their patients with the same degree of satisfaction. No argument is required to establish the fact that when the average of young men who apply for matriculation at the dental colleges is taken, a superficial observation shows that they have not the mental make-up of medical students. They are moved to enter a dental college largely by mechanical instincts. A man with this mechanical bent cannot be forced to absorb a large amount of theoretical knowledge on subjects not closely allied to the mechanical subject of dentistry. The question

is one of temperament, and it is vain to attempt to force upon any man a system of training which meets no response in the impulses of his nature.

As regards the medical profession, it is a question whether the men who have given dentistry the most encouragement to fully identify itself with the parent body have the slightest appreciation of the patient application necessary to acquire the digital facility which alone renders the dentist of special value to his patients. The physician admires the dentist who comes nearest to being a physician, for then for the first time he understands him, but he does not at all understand him as a dentist and does not especially admire him. Why should the dentist expect to practice even plastic surgery of the face or mouth? What are specialists for? Why does not the rhinologist or larynologist occasionally operate on the teeth? Granting that a large majority of the dentists could be qualified to practice oral surgery in the fullest significance of the term, would they be called on to any considerable extent to so practice, and could they be expected to compete successfully with the surgeon enjoying a far greater range of opportunity in the same line? As a matter of fact, dentists who practice dentistry acceptably usually have their hands full. To keep pace with the advancement of strictly dental science is enough for the average man. Finally, all the knowledge of medicine which the dentist needs he should be able to get in the dental college. For what other purposes have the colleges extended their course a year, looking to a further extension in the near future? On what rational ground can it be maintained that chemistry, therapeutics, anatomy, histology, etc., cannot be as thoroughly and satisfactorily taught in the dental college as in the medical college? Personally, I freely admit my regret that I did not take a full medical course, but at the same time I am not in sympathy with anything which belittles dentistry as regards its standing independent of any closer relationship to the medical profession, and I believe the dental colleges are in all respects the best medium for qualifying the incoming dentist for the practice of his profession.

Dr. H. A. Smith: The trend of modern education is to fit the young man specially for the occupation which he is to follow. Beyond that there can be no objection whatever to an acquisition of broader knowledge. The requirements made upon us as dentists

are gradually broadening and our colleges are extending their courses of study to meet these demands. Our essayist was a skillful dentist when he held only the dental degree, but having acquired the degree of M. D. for the purpose of practicing rhinology in connection with dentistry, he naturally thinks he acquired useful knowledge for the practice of dentistry that he would not otherwise possess. I contend that Dr. Heise, with his habits of study, would have acquired the needful knowledge without the aid of strictly medical teachers.

Dr. Heise, closing discussion: I cannot agree with the opinion repeatedly expressed here to-night; that the dental colleges afford the same advantages to the student in histology, pathology, bacteriology and physiology as do the medical schools, for the former lack the advantages of properly conducted laboratory courses and the practical clinical instruction in medicine. Of what use is book knowledge of medicine without practical application of same? In this regard the dental colleges will always be deficient.

As to the statement that dentistry is *sui generis* and cannot be merged into the medical profession because of its mechanical nature, I would reply that it is not more so than some of the specialties of medicine. Ophthalmology is perhaps more like dentistry than any other in this respect, being largely mechanical. Take, for instance, the examination of the eye and the prescribing of glasses—a mechanical operation in every sense of the word. It is true that the oculist does not grind his own lenses, make his own spectacle frames, etc., but a great deal of the purely technical in dentistry could and should be much better done by men expressly trained for the purpose, working under the supervision of the dentist.

As to the statement that the average dentist possesses more digital dexterity and skill than the average medical specialist, we must not imagine that other specialists are bunglers in this respect, for many of them are first-class operators and equal to any dentist. Some of them might be better, but the majority of dentists are not up to the standard.

It is to the disadvantage of dentistry that it was ever divorced from the medical profession, as happened in the time of Dr. Chapin A. Harris, for it would have been further advanced as a science and have been more efficient in many ways than it is to-day if that separation had never taken place.

CONSIDERATION OF CONDITIONS OF THE INTER-PROXIMAL SPACE.

By J. T. MEADORS, D.D.S., COLUMBIA, TENN. READ BEFORE SOUTHERN BRANCH NATIONAL DENTAL ASSOCIATION, AT NASHVILLE, JULY 29-31, 1901.

However simple this subject might seem to one at first thought, after a few moments of reflection he soon sees that there are points of very great importance to those practitioners who are desirous of producing the results which are most satisfactory to the comforts of their patients and the durability of their work.

Before entering into the consideration of the subject, you must first know the condition as it normally appears, hence I will briefly refresh your minds as to the anatomical and physical makeup of the interproximal space. When the teeth occupy their proper position in the dental arch, their proximal surfaces are supported one against the other at a point near to the occlusal surface of the teeth, known as the contact point, causing by such an arrangement a triangular form between the teeth, the basis of which is made by the border of the alveolar process and apex at the contact point. This space is normally filled with gum tissue which has an arched form bucco-lingually, the crest of each arch being near to the contact point. Provided the point of contact is small, while masticating any fibrous foods the mass is severed at this point of contact, and as a result of the form of the gum tissue, as well as its elasticity, the food is passed from the region of the interproximal space.

When by decay the proximal surface of a tooth is lost, especially when the decay has been so extensive as to cause a breaking down of the proximo-occlusal border, the teeth seeking support one against the other move closer together and thereby nearly obliterate the interdental triangle, causing the gum tissue to festoon abnormally on the buccal and lingual surfaces. Because of the improper contact of the surfaces of the teeth, fibrous material and foreign matter wedge into this space and crowd the gum tissue in such a way as to reverse the arched arrangement, and by decomposition cause an inflammatory condition of the tissues adjacent thereto. In such cases and under such conditions you will find that of necessity your first act will be to separate the teeth by use of cotton or gutta-percha, and restore the original conditions by properly inserting a filling so contoured as to produce a contact point near to the proxi-

mo-occlusal angle, not broad but of sufficient strength and density to prevent the wear of the point by lateral motion of the teeth while masticating. The interdental triangle having been restored, the abnormal festoons soon disappear and the gum tissue resumes its natural crest form. Should you make the contact point broad and the surface of your filling flat, you will find the wedging of foods into this space a source of great discomfort to your patient and a too frequent cause of failure of your filling.

Upon careful examination of a set of teeth properly arranged in the arch, which can best be studied by inspecting a skull, you will find the point of contact of each tooth very small, practically of not sufficient width for measurement, and varying upon the surfaces of certain teeth. Close inspection will reveal the fact that the point of contact upon the superior bicuspid and molars is nearer the buccal surfaces than the lingual, whereas in the lower arch the contact point is nearer midway between the buccal and lingual surfaces. You will also find as a rule a great difference in the surfaces of the teeth, for instance, the first superior molar is upon the mesial surface prominent at a point towards the bucco-occlusal angle, and then falls away very rapidly towards the gingival and towards the lingual, whereas the distal surfaces of all molars are decidedly rounded and broad, falling away to the gingival. The most decided difference in the location of the contact point is observed in the case of the bicuspid, the point with the superior bicuspid occurring decidedly towards the buccal, whereas, because of their rounded form, the point with the lower bicuspid occurs nearer midway between the buccal and lingual surfaces.

Your attention has been called to these anatomical conditions in order that when inserting gold fillings or constructing gold crowns you may as closely as possible imitate nature. I have always favored making the contact point upon my fillings in the superior bicuspid nearer midway between the buccal and lingual surfaces than occurs in nature, because I desire that after the food is parted both the buccal and lingual borders of the filling may be equally polished by the passing of an equal amount of food over each margin.

Another condition which too often causes discomfort to your patient and failure of otherwise good work is the overhanging of filling materials. In large cavities upon the proximal surfaces, especially where the filling extends beneath the gingival margin, it

is hard to know that you have removed all the overhanging material. With gold you find it difficult to polish down to a smooth surface flush with the enamel margins, and with amalgam you frequently find upon the return of your patient that some of the material while soft has worked up beyond the cavity margin, and has set and become a source of irritation to the tissues of the interproximal space. Other conditions, such as accumulation of calculus or wedging of broken toothpick or straw into the interdental space, are common to us, as we have these to deal with daily because of the discomfort of our patients. All of this I cite because of the too little regard we as a profession have for the proper care of this important space. The operator who files between teeth and reverses the interdental triangle, no matter how dense may be his filling, or how flush it may be against the enamel margins, has by reversing this triangle done his patient a very serious injury.

In testing the proper relation of teeth one to another as regards the interdental space the floss silk is of greatest assistance. In passing the floss between the teeth you will find that it is brought to a stop at a point near the occlusal border, and with some little pressure it snaps into the interdental triangle and moves laterally with proper freedom. Upon removal you will find that the floss passes over the surface of either tooth with ease until you again reach the contact point where you are required to use a little force to remove same.

A proper knowledge of the anatomical and physical condition of the interproximal space, with careful manipulation of his materials, and with the desire for the reestablishment of the contact point, and the determination to make the best of means at hand, classifies the operator as one of those of whom Milton Young wrote:

"Thy purpose firm is equal unto the deed,
He who does the best his circumstances allow,
Does well, acts nobly, angels could do no more."

Discussion. *Dr. Gordon White*, Nashville: This subject is an interesting one, but I am disappointed because the essayist did not give us a single new idea. The only thing that I noticed was the use of gutta-percha for separating teeth, but this method is too slow to be practicable. Gutta-percha is used to hold the teeth apart after they have been separated by cotton or other agents, but this is all, and if Dr. Meadors has some special plan he ought to explain it.

Dr. J. H. Crossland, Montgomery, Ala.: Dr. Bonwill taught the profession years ago how to separate the teeth with gutta-percha, and I supposed the method was common practice with all dentists. Dr. Meadors has done well to repeat and to impress on all of us that the interdental spaces must be protected and guarded, so that food will not be driven by mastication between the teeth and into the gingival tissue.

Dr. R. K. Luckie, Holly Springs, Miss.: In societies we often have papers and clinics that are not new, but where they clearly teach a useful lesson they are worthy of repetition. When cotton is used it must be renewed each day to secure sufficient separation, but one plug of gutta-percha can be left for several days, and it will gradually widen the space between the teeth.

Dr. M. C. Marshall, St. Louis: Such papers as this have been read for years, but nevertheless all members of the profession are not familiar with the principles set forth, as is evidenced by the work which we see in the mouths of their patients. Working without separation causes serious trouble.

Dr. W. V-B. Ames, Chicago: A Chicago lady while visiting in Philadelphia called on a prominent dentist for service. Her teeth had a great many interproximal cavities, and the dentist used pink base-plate gutta-percha to secure the necessary separation. The lady was soon after taken sick and went to the seashore, returning direct to Chicago. By this time the separation between her teeth had become so great that her face was actually deformed by the protrusion of her front teeth. I removed the gutta-percha and filled the teeth, and they returned to their proper positions. I would warn you all not to leave gutta-percha between the teeth too long, thinking that it is not active.

Dr. W. E. Walker, Pass Christian, Miss.: I believe it is well to repeat these important points of practice, as we are all benefitted thereby. In a simple cavity between the teeth gutta-percha is a good filling material, but in a compound cavity of the approximal masticatory surface there is scarcely a limit to the separation that can be secured by using the tough pink base-plate gutta-percha.

Dr. Gordon White: Gutta-percha as used by Dr. Bonwill was not intended for separating, but was a filling material and remained in the teeth for years. By the force of mastication gutta-percha

can be pressed down between the teeth, and if left long enough it will be pressed into the gingival border and cause inflammation.

Dr. Meadors, closing discussion: Notwithstanding Dr. White's criticism I am pleased that my paper has brought out such a full discussion. I do not pretend that it has any absolutely new ideas, but many dentists fill approximal cavities without securing the proper separation, so the points I urged are of enough importance to be frequently repeated. When separating, I fill the approximal cavity with the gutta-percha, leaving some excess, and by the force of mastication it is forced between the teeth and separates them.

ORAL HYGIENE.

BY J. P. CORLEY, D.D.S., GREENSBORO, ALA. READ BEFORE SOUTHERN BRANCH NATIONAL DENTAL ASSOCIATION, AT NASHVILLE, JULY 29-31, 1901.

The practice of oral hygiene has long been limited to the narrow confines of the oral cavity, and its most ardent devotees have done little more than insist on cleanliness and proper exercise of the teeth. This, of course, has been in keeping with the mechanical basis upon which our science was premised, but with the advance in dental education, which guarantees to the graduate dentist of to-day a knowledge of biology almost equal to that of the medical profession, he is qualified to institute a broader and more thorough system of hygiene.

The great barrier which stretches its spectral arms across his path is the public's impression that the teeth are things apart, free from the influence of environment, and destined for all time to run a prescribed course, amenable only to operative intervention. Also, the popular impression that the dentist is in fact a *toothist*, pure and simple, as though the object of his care existed as in a test tube. We have been toiling through the tedious years that we might bequeath to future generations more perfect dentures, with approximate immunity from the need of patchwork, yet we have not required that cooperation and assistance from our clientele without which our efforts must ever result in failure. The day when a man could afford to retain a patient who habitually and wilfully neglected his dental organs has passed. On the other hand, the public has been slowly taught to appreciate the intelligent dentist. His people recognize in him the artistic scientist and are usually willing to enter into the spirit of his profession.

It is mainly through the mothers that we can hope for a hygienic regime which will be truly prophylactic in its last analysis. Clinical observation, as well as scientific research, prove that the period of greatest susceptibility is during the time when the patient is still under the care of his guardian. This fact is both suggestive and encouraging. Habits of cleanliness and laws of health can be enforced, and when established at this early age will be more permanently maintained. Then, again, if this critical period be passed with freedom from serious decay comparative immunity will follow. The two great channels through which we can hope to reach this maternal head are the medical and educational professions. It is encouraging to note that some of our medical schools have regular lectures on oral hygiene, as the M. D. thus goes into practice with a greater appreciation of the importance of a prophylactic regimen, and also with some knowledge of a practical dental toilet. Some of the public and normal schools are having illustrated lectures on the subject and are beginning to enforce its technical observation. Let us use our individual and collective influence to further the work in this direction.

After all, however, there is an opportunity which comes to each of us alike, and may be used to greater or less advantage by all—the constant teaching at the operating chair, and a demand for the courtesy due us. To do this with success we must study the individual patient as we would a book. We must know what to say and when and how to say it. Above all we must be firm and uncompromising in our demands. The work is of so great magnitude that the efforts of a few individuals can accomplish but little. Every state, sectional and national society should have a standing committee to push the work and act in harmony with the National committee. These committees should have a representative at every medical and educational meeting in the country.

We have had the privilege of presenting the matter to both of these professions in Alabama and have met with nothing but encouragement from all. I say that the land is ours if we will but rise and possess it. Let us take advantage of the great tidal wave of interest which is to sweep over our country, the advance indications of which are before us, and by a thorough preparation for the exigencies of the hour press the work of hygiene and prophylaxis.

Discussion. *Dr. H. W. Morgan*, Nashville: This subject has

attracted attention from time immemorial, and I am glad to know that some good missionary work is being done among the school children. That is the place to begin. If we are to do this work and do it in such a manner that there will be no opportunity for unworthy men to get hold of it in a way to advertise themselves, it will do a great good. It is work that will have to be done over and over again each year, because you do not have the same crop of children to deal with, so there will be no end to it. Much can be done through the school teachers, if you can get them interested in it. Our school board some years ago prepared a circular letter that was sent to all of the teachers, and they were requested to read it to their classes twice a year. Some of the teachers took a great interest in the matter and did a great deal of good in their schools. I think dentists should make more effort to impress the necessity of greater care of the children's teeth upon their patients while they are in the chair. This is a golden opportunity. While the patients are suffering from the neglect of their own teeth teach them that care will preserve the teeth of their children. They will be apt to heed the advice when they realize that the pain they are suffering is the consequence of their own neglect of these important organs. There is a great sentence which old Dr. Freeman frequently repeated to his patients—"Clean teeth do not decay." Many of my own patients have thanked me for that saying.

Dr. Corley said it was well for poor human nature that there were some bright spots along life's pathway. He was getting to the point of believing that oral hygiene is the foundation and superstructure of all dental practice. Dr. Walker, chairman of the committee on oral hygiene of the National Dental Association, has furnished blanks to be sent to dentists and to the superintendents of schools for the purpose of having examinations made of the mouths of school children. To avoid the possibility of jealousy, all the professional dentists in each of the smaller towns should unite in the work and do it together or alternately, or by agreement select some one to attend to it. When the examinations are made all children are given a blank with a report on it of the condition of the teeth. This they carry to their homes and it serves to call the attention of their parents to the subject and point them as to the needs of their children. He did not think there was any danger of this work being a help to the quacks. The mere fact that the profes-

sional men were doing the work, and were doing it unselfishly, would bring the parents to appreciate the difference between the professional and unprofessional dentists. The fact that we do not have the same children year after year is an advantage for us, as we will thus have more missionaries to carry the work on in the families. Oral hygiene does not benefit the teeth alone, for the sense of taste depends largely on the cleanliness of the mouth, while the health of the whole system may be and often is wrecked because of the lack of proper mastication due to imperfect teeth.

ORAL HYGIENE—REPORT OF COMMITTEE.

BY RICHARD GRADY, D.D.S., BALTIMORE. READ BEFORE THE NATIONAL DENTAL ASSOCIATION, AT MILWAUKEE. AUG. 8-9, 1901.

Two meetings were held at Old Point Comfort during the third annual session of the Association, at which a tentative plan was discussed and adopted. The task of communicating this plan to the state societies, and others, numbering fully one hundred, was entrusted to the Secretary, whose report, herewith submitted, will furnish statistical information. The Committee has been fortunate in having the gratuitous services of such an able Secretary, and wishes to take this opportunity to acknowledge the commendable zeal of Dr. Walker.

The suggestions toward popularizing oral hygiene have everywhere been received with favor. General knowledge of the causes of dental evils, the means of preserving the teeth by regular care, ought to form a part of the teaching of general hygiene in the schools. With the supporting influence of this National Association, and the mutual cooperation of the state and local societies with school boards, it is unquestionably true that children can be instructed in oral hygiene. The most important argument in favor of the examination of the mouths and teeth of school children is the educational benefit it would be to the community. Is it not the duty of the school to arouse society to intelligent thought on the importance of better modes of life? Is it not the duty of the school to train people to live better? Is not this the true purpose of the school? The logical place to begin this is with the physical life of society, the one phase of life that has been the most ignored by our educational methods.

The subject of instruction in oral hygiene in schools should

form a definite, systematically arranged series of topics discussed in such a way that children may be interested. Such a synopsis of a proposed text-book was presented to the Mississippi Dental Association, April, 1900, by Dr. Talbot, as follows:

Chapter I.—*The Oral Cavity*. General arrangements. The walls. The hard and soft palate. The upper and lower maxillae. The teeth. The tongue. The gums. The salivary glands.

Chapter II.—*The Maxillae*. Their development, structure, shape. Change of shape at different ages. Blood supply. Attachments. Articulation. The alveolar process.

Chapter III.—*The Teeth*. Their development. The calcification and decalcification of the temporary teeth. Shape of each. Their arrangement. Names. Time and order of eruption. Diseases attending eruption. Permanent teeth. Names. Shape. Articulation and arrangement. Time and order of eruption. Source of nutritive and sensitive supply. Arrangement of the enamel, dentin, cementum and pulp. Physical and chemical composition of enamel, dentin and cementum. The attachment of the teeth.

Chapter IV.—*Caries*. Predisposing causes: Faulty formation, manner of contact of proximal surfaces; hereditary influences. Active causes: Morbid condition of fluids of the mouth; mechanical abrasion; uncleanness. Prophylactic treatment: Diet; mouth-washes; dentifrices: brushes; picks; silk; rubber; use of gum; tobacco; hygiene during dentition. Examinations. Fillings.

Chapter V.—*Calculus*. Salivary. Serumal. Alveolar. Abscess. Ptyalism.

Chapter VI.—*Odontalgia*. Local odontalgia. Reflex odontalgia. Reflex neuroses of dental origin.

Chapter VII.—*Antiseptics*. Disinfectants. Deodorants. Germicides.

Chapter VIII.—*Mastication*. Insalivation, etc., of food.

Chapter IX.—*Foods*. Those containing nutriment for the teeth and bones. When and how they should be taken.

Chapter X.—*Congenital Defectiveness and Deformity of Teeth*. Immediate causes of deformity, as, 1, deficient nutrition; 2, diseased nutritive fluids; 3, imperfect formative organs; 4, diseased formative organs. Influences modifying the development of the teeth, as 1, heredity, 2, civilization; 3, nervous disturbances; 4, diseases; 5, drugs and artificial diseases. Anomalies of the teeth

and maxillae, 1, excess of individual teeth; 2, deficiency of individual teeth; 3, multiple dentition; 4, lack of dentition; 5, anomalies of arrangement; 6, malposition of individual teeth; 7, imprisoned teeth; 8, anomalies in size, structure and shape; 9, advanced and retarded eruption.

Public schools are made use of to a greater or less degree for the dissemination of hygienic knowledge in most civilized countries. The thoroughness and the mode of instruction cannot be conclusively judged from the reports. Much has been done in this country for the study of "physiological temperance," as most states and territories have a temperance educational law which requires instruction in the danger of alcohol, but in many states the instruction is not limited to narcotics and stimulants. For instance, one physiology which has been translated into five different languages, with several hundred thousand copies published, teaches this: "The teeth should be examined that if enamel is removed and decay commenced they may be filled with gold foil. All amalgams, pastes and other cheap patent articles should be rejected, both for the sake of the teeth and the general health." The author of this school physiology must have heard of mercurial poisoning from amalgam fillings! Another, a primer intended for instruction of children in the schoolroom, by "one of the most skillful dentists of the country, enlivened by bright illustrations which children will enjoy," teaches "that milk is a good food, but it is better for the teeth after it has been boiled than when left uncooked"; that "our teeth will let us have all the eggs we want, but they like them best soft boiled"; that "we may have all the fish we want, say our teeth, if we only eat what is fresh and sweet"; that the "pretty red color of the cheeks and lips of the Irish is due to their habit of eating potatoes"; that "tartar affects saliva and makes food hard to digest"; that birds eat gravel and sand "to make their food digest"; and answers the question, "Why does a dog keep on gnawing his bone after the meat is all gone?" by saying, "He does it to keep his teeth clean and strong."

Greater efforts in behalf of disseminating oral hygienic knowledge in schools have lately been made in Alabama, where "the way is open to us"; in Florida where "the State Superintendent of Education is very favorably impressed on the subject"; in Illinois, where the Odontographic Society of Chicago has "sent circular

letters to the Boards of Education in all civilized countries in cities of one hundred thousand or over, asking them concerning such a movement, and gathering data upon the subject"; in Massachusetts, where "a committee of five has been appointed to investigate and report on the best method of getting at the condition of children's teeth in the public schools"; in Maine, where the subject has been discussed and a committee appointed; in Mississippi, where the matter is in charge of a special secretary; in New York, where the state society has appointed a committee of six, and its chairman, Dr. T. B. Hyatt, has already examined five hundred children in Brooklyn and reported results on blanks furnished by this Association; in Texas, where a committee from the medical society is working jointly with one from the state dental society; in Maryland, where a committee has planned for the examination of the mouths and teeth of school children, for talks to the students of the high schools on the care of the mouth and teeth, and for the aid of assistance in sterilizing instruments and in filling out examination blanks, and the Baltimore County Medical Association (as the result of a paper on the "Preservation of the Health of the Mouth") unanimously adopted a resolution recognizing the benefits of oral hygiene, approving the efforts to give instruction to pupils of public schools on the care of the mouth and teeth, and urging cooperation of boards of health and education in providing for detailed examinations and reports; in the Seventh District Dental Society of New York, where "the Committee is working to the end of having suitable matter inserted in the text-books"; in Virginia, where arrangements are being made for work in the fall; in Connecticut, where a committee has been appointed to confer with the school authorities; in the Duluth and Superior Dental Associations, where a committee has been appointed to go into the schools and make the examinations, two dentists for each city. From the District of Columbia Dental Society comes the word, "We shall be glad to obtain statistics for any number of examination blanks you may wish to furnish"; from the Galveston Dental Society, "Send the blanks and we will fill them out"; from the Toledo Dental Society, "The committee appointed by the local society has been waiting for some definite action by the National Dental Association giving rules and suggestions that we might all work on the same line, so send examination blanks and diagrams"; from Cedar Rapids Dental Society,

"Nothing of the kind has been done in this city, but we are willing to do it, if permission can be had from the school boards"; from Pittsburg, where Dr. Habegger obtained permission from school directors of that city to make examination of children attending the Morehead School and examined three hundred and sixty-eight children. A significant fact in this report is, that out of fifteen hundred children in the school only nine refused to be examined.

The writings and addresses of professional men on the subject are familiar to you as readers of dental journals, so no quotations are noted in this report, but as evidence that the question is timely note some articles published in the *School Journal* of New York and the *Teachers' Institute* of Chicago, of which an editorial from the *School Journal* of Feb. 9, 1901, follows:

"Care of the Teeth. Physiology has become one of the fundamental studies in the elementary schools. In connection with it is given instruction in the simple laws of hygiene. Special attention is devoted to the evil effects of alcoholic beverages and narcotics. All this is commendable and encouraging to the friends of educational progress. The well-being of the body cannot be too highly regarded in the making up of school programs.

"One logical result of the more intelligent interest of the people in matters concerning the health of children is the introduction of expert medical inspection of the schools. Thus far this inspection has confined itself largely to the sanitary conditions of school buildings and the general health of pupils. If there has been any specialization it has been examination into the condition of children's eyes and ears, and perhaps also of the nose and throat. One important factor seems to have been largely disregarded, and that is the need of a periodical dental inspection. The principal reason for the oversight is probably to be found in the lack of interest on the part of the average physician in the health of teeth. This field has long been left entirely to the dentist, and the latter has not, at least in the United States, been made a member of the boards of medical examiners for schools. In Germany, France, Belgium, Sweden and Japan the importance of the examination of school children's teeth by a competent dentist has long received practical recognition. In Great Britain the question has been agitated for years, and all signs point to a speedy adoption of dental inspection and the teaching of the proper care of the teeth at least in city schools.

"The usual plan is to employ dental surgeons to make periodical examinations of every pupil. Records are kept and parents are advised concerning proper care, or free treatment is given to the poor. A similar system is very much needed in this country. State, county and municipal examiners of children's teeth must become a part of the public elementary school machinery.

"Meanwhile instruction in the care of the teeth ought to be made part of the elementary school course in physiology and hygiene. So much depends upon cleanliness and health of the mouth and teeth that the reasonableness of this proposition will be at once recognized. The decay of the temporary teeth may work lasting injury. Digestion is frequently impaired by imperfect mastication due to defective molars. The presence of microbes bred in particles of food left between the teeth is often the source of serious stomach troubles. Nervous difficulties of various kinds can be traced to neglect of the teeth. And the inference is by no means far-fetched, that the development of serious lung diseases has resulted from a neglected mouth. The wisdom of increased attention to the education of children in the things affecting their present and future health and strength is evident to every intelligent adult. No difficulty ought to be encountered, therefore, from the side of school officers in introducing lessons on the care of the teeth and mouth in the elementary schools."

ROOT-FILLING CLINIC.

REPORTED BY H. J. GOSLEE, D.D.S., CHICAGO, BEFORE THE NATIONAL DENTAL ASSOCIATION, AT MILWAUKEE, AUG. 6-9, 1901.

This proved a most interesting feature, showing the degree of success achieved, and the great variation of methods pursued by the operators. The canals of the teeth properly mounted were filled by the following: R. H. Hofheinz, S. C. G. Watkins, C. N. Johnson, E. K. Wedelstaedt, C. P. Pruyn, J. D. Patterson, L. S. Tenney, W. A. Johnston, M. L. Hanaford, H. L. Banzhaf, J. E. Keefe, J. W. Wassall, Elgin MaWhinney, J. J. Wright. Of the twenty-eight teeth so filled their subsequent dissection showed twenty practically perfect root fillings. The appended abbreviated record, in which the identity of the operator has been purposely lost, will prove interesting and show the results.

No. (Operator)	Result. (Designating Each Tooth.)		Method and Manipulative Procedure.			
	A.	B.	Cleaning and Enlarging.	Drying.	Lubricating Sub- stance.	Filling Material.
1	Imperfect.	Perfect.	Gates-Glidden Drill and Twist Broaches.	Alcohol-Air.	Sol. Eucalyptus and Gutta-Percha.	Gutta-Percha Cones.
2	Imperfect.	Imperfect.	Twist Broaches.	Electric Drier.	Sol. Eucalyptus and Gutta-Percha.	Gutta-Percha Cones.
3	Imperfect.	Perfect.	Barbed Broaches.	Alcohol and Com- pressed Air.	Eucalyptus.	Chloro-Percha and Gutta-Percha Cones.
4	Perfect.	Perfect.	Barbed and Twist Broaches.			Oxychlorid Zinc, Gutta-Percha Cones and Amalgam.
5	Perfect.	Perfect.	Gates Glidden Drills and Barbed Broaches.	Hot Air.	Eucalyptus and Gutta-Percha.	Gutta-Percha Cones.
6	Imperfect.	Perfect.	Sulphuric Acid, Spiral and Barbed Broaches.	Alcohol and Hot Air.		Asbestos, Aristol, & Gutta-Percha Cones dipped in Chloro-Percha.
7	Imperfect.	Imperfect.	Sulphuric Acid, Spiral and Barbed Broaches.	Alcohol and Chloroform.	Oil Cajuput.	Chloro-Percha and Gutta-Percha Cones.
8	Perfect.	Imperfect.	Sulphuric Acid, Williams' Reamer and Broaches.	Alcohol and Air.	Eucalyptus.	Copper Points, Chloro-Percha and Gutta-Percha Cones.
9	Perfect.	Imperfect.	Broaches, Sulphuric Acid and Bicarbonate Soda.	Alcohol and Root Drier.	Chloroform.	Gutta-Percha Cones.
10	Perfect.	Perfect.	Sulphuric Acid, Ammonia, Barbed Broaches.	Compressed Air.		Chloro-Percha and Gutta-Percha Cones.
11	Perfect.	Perfect.	Broaches.	Alcohol and Air.	Eucalyptus.	Chloro-Percha and Gutta-Percha Cones.
12	Perfect.	Imperfect.	Sulphuric Acid, Broaches.	Alcohol and Air.	Eucalyptus.	Chloro-Percha and Gutta-Percha Cones.
13	Perfect.	Perfect.	Sulphuric Acid, Barbed Broaches.		Alcohol and San- darsac Varnish.	Copper and Gutta-Percha Cones.
14	Perfect.	Perfect.	Twist Broaches.		Alcohol and San- darsac Varnish.	Gutta-Percha Cones.

Digests.

ALVEOLUS REMOVED. By W. R. Howard, D.D S., Newport, R. I. The opportunity presented itself to perform an operation, the occasion for which is rare, but which may be of interest. Last September a woman called at my office for treatment. Her teeth were in extremely bad condition, and there was obviously but one course to pursue, viz., extraction and insertion of artificial teeth. From the remains of her denture it was easy to judge what an unprepossessing appearance it must have presented at its best—the teeth being very small, with spaces of at least a quarter of an inch between the anterior ones. Consequently, it was but natural that she should be anxious to have the dentist improve on nature.

MODEL No. 1.



I extracted the teeth and told her to return in six months, and she came according to instructions. I took an impression and started to make the upper denture, but on inserting the trial plate found it absolutely impossible to obtain any effect that could be tolerated, on account of the protuberance of the alveolus in the anterior portion of the mouth. I think anyone can get an idea of the impossibility of the case by a glance at Model No. 1. What to do I was at a loss to know, but it occurred to me that it ought to be possible and practicable to remove quite a portion of the alveolar process. I searched through reference books for a precedent, but could find none. I then consulted Dr. Brackett (Professor of Pathology at Harvard Dental School) and Dr. Darrah, a local surgeon of ability, and we decided that there could be no objection to the course I suggested, so we planned to carry it out.

The operation was done at the patient's home. She was laid on a long table and ether administered; then with a surgeon's knife I made a clean incision from cuspid to cuspid on a line with the natural position of the teeth clear through to the bone. Then with a periosteal elevator I pushed back the gum and periosteum, completely exposing the alveolar process for some distance both lingually and labially. With a pair of alveolar forceps I made an incision through the alveolus at the median line from a quarter to a half-inch in depth, and with that as a starting-point, using surgeon's bone-clippers, removed the alveolus to about the same depth to each of the cuspids. At Dr. Brackett's suggestion I had the dental engine at hand, with a variety of mounted carborundum

MODEL No. 2.



stones, and found it but a few moments' work to grind smooth any roughness which remained after using the bone-clippers and which would have greatly retarded the process of healing. The gum was then replaced and trimmed, allowing a sufficient amount for shrinkage, and four sutures of catgut made to hold it in place.

I saw the patient the following day and she seemed to be progressing favorably, with very little soreness of the gums. I told her to return when it seemed to be thoroughly healed and free from tenderness, and to my surprise she was back in just two weeks from the day of operation. I proceeded to make an artificial denture without any gum in front, and succeeded to her complete satisfaction as well as my own.

Model No. 2 shows the mouth after operating, though the actual case ought to be seen to realize the great change that was made in her appearancee.—*International Jan.*, 1902.

SMOKING AND EPITHELIOMA OF THE TONGUE. The question of the influence of smoking in the production of epithelioma of the lip has often been raised, and there is a general belief among surgeons that the use of tobacco is an important factor. Carcinoma of the tongue is fortunately a much rarer disease, and the influence of smoking in its production has not been frequently considered. In his latest edition of "Diseases of the Tongue" Henry T. Butlin states that he feels justified in speaking much more strongly on this subject than he ventured to do some years ago at the time of the appearance of the former edition of his work. He believes that smoking is a decided factor in the causation of cancer, not so much directly as indirectly, rather by producing or tending to produce these conditions of the surface of the tongue which predispose carcinoma than by immediately leading to the development of carcinoma in such tongues. He states that he does not rely so much on the statistics in support of this view as his personal experience with individual sufferers with precancerous conditions of the tongue and actual carcinoma. Thus Whitehead found only 61 smokers among 104 persons suffering from carcinoma of the tongue, which seemed almost a small proportion, but the common history which we receive of much smoking, the great frequency with which carcinoma of the tongue is preceded by chronic inflammation of the surface of the tongue which has occurred in smokers and has been maintained by smoking, and the greater liability of males to the disease than females, leads to this view. Further confirmation of this belief is found in the fact that up to the present century but little attention was paid to the disease of the tongue. The introduction of tobacco in Europe at the end of the Middle Ages is thought to have had a great influence in the production to the disease.

Whatever influence tobacco may have in the production of carcinoma of the lip or tongue, it is exceedingly improbable that this fact will have much influence in preventing the habit of smoking. But, as Butlin suggests, it is probably more the irritation than any specific injurious quality of the tobacco itself. Hence smokers who would be wise should avoid the use of the stronger grades of tobacco, those forms of tobacco which to give aroma are mixed with various chemical and other substances which may be irritating, and the use of short stemmed pipes, and they should discontinue smoking the stubs of their cigars and cigarets until they burn the lips and

tongue. Those who have sufficient belief in the influence of tobacco as a specific factor in producing carcinoma can hardly have any other resort than to discontinue the habit.—*American Medicine*.

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ANTRAL INFECTION IN DIPHTHERIA. Dr. Carolus M. Cobb of Boston, in a discussion before Mass. Valley Med. Assn., of the morbid conditions of the upper respiratory tract resulting from the infectious diseases, showed the relation of the infectious diseases to the chronic inflammatory diseases of the upper air tract; first, by an analysis of the reports of the autopsies held by Wolff and Richard Mills Pearce, and second, by an analysis of 102 cases of chronic nasal and post-nasal discharge which occurred in his service in the Lynn, Mass., hospital. Under the first of these analyses we find that Wolff has reported the results of bacteriological examination from the autopsies of 22 cases of diphtheria, 5 cases of measles, and 2 cases of scarlet fever. He found the antrum of Highmore involved in all the cases of diphtheria, and in many of the cases one or more of the other sinuses were also affected. The inflammation of the sinuses varied in intensity; in 15 of the cases it was severe, and in 12 of these the Klebs Loeffler bacillus was found; the other 7 were mild attacks caused by other bacteria. Three of the five cases of measles showed inflammatory changes in the antrum. Cultures showed streptococcus and pneumococcus in two cases and the staphylococcus in one. In one of the cases of scarlet fever the antrum and sphenoid sinuses were involved, and cultures showed staphylococcus pyrogenes aureus and the bacillus pyocyaneus. The other case showed no inflammatory changes and the cultures were sterile. Richard Mills Pearce of Boston City Hospital reports that he obtained cultures from autopsies of 39 cases of diphtheria, 2 cases of diphtheria with measles, 5 cases of diphtheria with scarlet fever, and 4 cases of scarlet fever. Inflammatory changes were present in 25 of the 39 cases of diphtheria. The number of the sinuses involved varied in the different cases, the antrum being the most often affected, i. e., in 16 of the 25 cases. Both cases of diphtheria with measles had double antral disease, diphtheria bacilli and streptococci being found in both antra in each case. Only 2 of the 5 cases of diphtheria with scarlet fever had disease of the accessory sinuses, but in one of these cases all of the sinuses were involved, and in the other the disease was unilateral. Cultures from one case

showed Klebs Loeffler bacilli and a variety of unrecognized bacteria; from the other streptococci and staphylococci. Inflammatory changes were present in the accessory sinuses in 3 of the 4 cases of scarlet fever. Cultures showed streptococcus and staphylococcus albus and aureus, and the bacillus pyocyaneus, and in one a short diplo-bacillus.

Under the second division the clinical manifestations of this involvement of the sinuses is shown by an analysis of 102 cases of nasal or post-nasal discharge which applied for treatment in the outpatient department of the Lynn, Mass., hospital. The whole number of patients was 243; of these 112 were adenoids and enlarged tonsils, 29 were nasal obstruction, and 102 were cases of nasal or post-nasal discharge. Only 17 of the cases of nasal obstruction complained of nasal discharge, and these are not included in the analysis. Of the 102 cases which complained of a nasal or post-nasal discharge without nasal obstruction, 31 had existed from childhood or did not know when it began, 25 followed influenza, 14 followed diphtheria, 11 followed repeated colds, 6 followed scarlet fever, 7 followed measles, 4 followed typhoid fever, 2 followed pneumonia, 2 followed whooping-cough.

This conception of the catarrhal inflammations of the upper air tract places them in a new light and leads to a reasonable hope of their successful treatment. The paper should be read in full, as it is a thoughtful presentation of question.—*Med. Mirror*.

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NERVOCIDIN. By Theodore Söderberg, D.D.S., Sydney, N. S. W. As tabulated statistics of clinical experiments with nervocidin have already been published, I shall limit my contribution to a few general remarks (purely empirical) on my clinical experience with the drug. The remarkably quick action of nervocidin is perhaps the first point observed. In many cases of exposure the pulp can be painlessly extirpated after a few hours' application of the drug. The next point observed is that nervocidin has not the deeply penetrating quality of arsenic. In most cases of non-exposure two applications are required to sufficiently anesthetize the pulp prior to extirpation, the first being for the painless exposure of the pulp, the second for its removal. Another point soon noted is the long duration of the analgesic effect of nervocidin. Not being a caustic or an escharotic, it acts on the pulp in a totally different way from arsenic.

Arsenic devitalizes, nervocidin anesthetizes or paralyzes the tissues. Clinical proofs: Seal an arsenic dressing for twenty-four hours over a freshly exposed pulp; result, devitalization beyond resurrection. Seal a nervocidin dressing similarly; result, *apparent* or partial death of pulp. Remove dressing and all traces of nervocidin; seal a eugenol dressing over exposure for a week; result, pulp highly sensitive. Again, seal an arsenic dressing forty eight hours in the shallow, hypersensitive buccal cavity of a lower molar; result, (1) death of the contents of tubuli, with (probable) ultimate death of pulp; (2) sloughing on cheek in contact with the seal. Seal nervocidin similarly; result, hypersensitiveness gone and no sloughing on cheek. Now excavate freely and fill cavity for a week with a zinc oxid-eugenol filling; result, return of sensitiveness of dentin.

Until otherwise convinced, my opinion is that nervocidin acts paralytically on the nerve fibrils. Can, then, nervocidin be fearlessly used as an obtundent for sensitive dentin? Perhaps it can and perhaps it cannot; time alone can answer that question. All I can add to the above opinion is the advice to those practitioners who dare the experiment to carefully choose their test patients, and then proceed as follows: Mix oxysulfate (or oxyphosphate) to medium thickness, and incorporate with it a small quantity of nervocidin. Dry the sensitive cavity with bibulous paper, and insert the filling. From two to forty-eight hours after (according to experiment) remove cement, excavate, and fill permanently. *Watch that tooth!*

Does pain follow the application of nervocidin? My experience so far is that some pain generally follows in cases of acute pulpitis, but the pain is not nearly so constant and severe as that felt after the immediate application of arsenic in similar cases. Where acute pulpitis is absent pain does not as a rule follow. In two cases I found, however, tenderness to occlusion after the fourth day—why, I cannot explain satisfactorily, as nervocidin, unlike arsenic, does not cause hyperemia of the pulp, and does not appear to be a sufficiently strong irritant poison to produce a toxic periodontitis similar to that often produced by arsenic after its retention in the cavity longer than forty eight hours. After fully exposing the pulps in these two cases (both upper and third molars), I found the color to be a light pink, and no trace of septic infiltration present; hence neither hyperemia nor gas formation could account for the tenderness. Nor did the seal interfere with proper occlusion.

As nervocidin does not cause hyperemia of the pulp, its use for the anterior teeth should be indicated in preference to arsenic, with its concomitant discoloration of those teeth. *In all cases of pulp-extirpation or amputation where the decay extends beyond the gum-margin or where the seal comes in contact with the oral tissues, nervocidin must in the future be substituted for arsenic.* This statement I consider unassailable. The relative value of the two drugs in all other cases of devitalization, extirpation, or amputation of pulps is open to discussion. I personally give the preference to nervocidin in ninety per cent of all cases. Its sticky nature when moist renders it difficult to place in position per medium of absorbent materials, such as cotton-wool or spunk. A non-absorbent medium should be used, the under surface of which is moistened just sufficiently to take up the quantity of nervocidin, the dry upper surface being gripped by the pliers. It is preferable to have the cavity as dry as circumstances will allow, thus allowing a more reliable seal to be made. The introduction of nervocidin is one of the greatest events in modern dental pharmacology.—*Cosmos, Dec., 1901.*

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TRAUMATISM OF PHARYNGEAL AND LARYNGEAL MUCOUS MEMBRANES. Among the many interesting features of the investigations which have been carried on by Crile of Cleveland for the past few years, are those observations upon the inhibitory effect upon the respiratory and circulatory apparatus attending traumatism of the pharyngeal and laryngeal mucous membrane. In his studies of the pathogenesis of shock Crile has paid particular attention to the effect of trauma in different regions and tissues upon the blood pressure, and of particular interest were the results attending traumatism inflicted upon the mucous membrane of the larynx and pharynx. It was found that the subjection of the mucosa of the larynx or pharynx to any insult always had an inhibitory effect upon the respiratory and sometimes upon the cardiac apparatus, the upper or superior portion of the larynx being particularly sensitive. These inhibitory messages were proven to have been transmitted through the superior laryngeal nerve, as upon section of this nerve these inhibitory phenomena were not exhibited. The sudden deaths attending the introduction of the intubation of the tracheotomy tube may, according to Crile, be accounted for in this way. Many a surgeon can recall one or more occasions in his experience when sudden

death from respiratory failure, not from asphyxia, immediately followed the introduction of the tube. In some cases the anesthetic was held at fault, in others it was said that the tube had become plugged with a piece of membrane, and in other ways attempts were made to account for this sudden and fatal complication. Just at the time in which relief to the already partially asphyxiated subject is at hand, sudden death robs the surgeon of a recovery that seemed assured. That these deaths are not due to asphyxia will be admitted if one but stops to think of the clinical picture, noting particularly the almost instantaneous interruption of the respiratory act in sudden death from respiratory failure, which contrasts strongly with the increased respiratory efforts, lasting several minutes, by which the subject with asphyxia attempts to overcome the effects of obstruction to the ingress of air. If one could anesthetize the mucous membrane of larynx or pharynx before the introduction of the intubation or tracheotomy tube, or in laryngectomies before attacking the larynx itself, there is reason to believe that this complication could be averted. To this end Crile has introduced into his technique of this operation the complete anesthetization, by the infiltration method, of the tissues of the larynx.

The results of investigations upon the pharynx would seem to condemn the practice of vigorously swabbing out the fauces during ether narcosis. This is a practice which no doubt is justified in certain instances, as, for example, when the collection of mucus is large enough to embarrass respiration. We are inclined to believe, however, from our observations, that it is resorted to much more frequently than necessary, and in such instances it should be regarded as a mischievous practice. If, as Crile reports, vigorous traction of the tongue likewise produces reflex inhibition of the respiratory function, some caution should be observed in the restoration of patients by the rhythmical traction of the tongue. So, too, in those cases in which, in its relaxed state, the tongue falls back into the pharynx, the anesthetizer should be mindful of this possible inhibitory effect and should not apply the tongue forceps needlessly, nor make too vigorous traction upon that organ.—*Phila. Med. Jour.*

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CARBOLIC ACID AND CREOSOTE WITH ALBUMIN. By Joseph L. Mayer, Ph.D. Among the tests for carbolic acid given in the United States Pharmacopeia of 1890, we read that on adding

this "acid" "either to albumin or collodion coagulation takes place (difference from creosote)." In the "Digest of Criticisms" prepared by the revision committee of 1890 we find the following in reference to the pharmacopeial statement as to distinction from creosote: "This is certainly an error; it is creosote which coagulates albumin." In an endeavor to dissipate the uncertainty thus created in his mind, the writer thoroughly read the literature pertaining to the subject, and supplemented this by practical work, with results which follow. The only part of the pharmacopeial paragraph in doubt is that which had to do with the action of albumin or creosote, as the wording of the inference implies that carbolic acid and not creosote coagulates albumin. It was natural to expect then that under the article on creosote we should find a statement something like, "Does not coagulate albumin (difference from carbolic acid)," but such a statement is absent from the Pharmacopeia. Then came the thought that perhaps an earlier Pharmacopeia would reiterate its assertion made under carbolic acid, and say under creosote that it differed by not coagulating albumin. The 1880 edition rewarded the search; in addition to the notes on carbolic acid, which do not differ from those of the 1890 one, there appeared under creosote: "Creosote does not coagulate albumin." Why the present book should go only half-way is not apparent.

The new "United States Dispensatory" (eighteenth edition, August, 1899), under methods of distinguishing carbolic acid from creosote, says, "Creosote is distinguished by not coagulating collodion or albumin." To practically test the worth of these variously couched statements that creosote does not coagulate albumin the following tests were made: The white of an egg was taken, and after being thoroughly cut into small pieces with a pair of scissors (to aid solution) was thoroughly shaken with about twenty per cent of water to dissolve the albumin, and filtered; this solution was used throughout. The creosote used was Merck's beechwood variety of the highest purity, which withstood all the tests and did not in any way respond to any reactions for carbolic acid except the albumin one to be described. Two kinds of carbolic acid were employed. One a very pure natural product, and the other a pure synthetic article. The tests were carried out in three-dram cork-stoppered homeopathic vials, as they were more convenient to shake and handle than test-tubes. The carbolic acid had added to it just

sufficient water to keep it in a liquid state; the conditions as to quantities, etc., were alike throughout, and the number of tests aggregated about sixteen.

In every case where creosote and albumin were mixed the mixture almost immediately coagulated, that is, formed a mass so gelatinous that it could be cut with a knife. The natural carbolic acid and albumin formed a liquid with white flocculi, and the mixture remained mobile for at least four days before gelatinizing. The synthetic carbolic acid and albumin formed a very fluid mixture which showed but a few flakes and did not at first give any evidence that it would ever gelatinize, but after six days it did so, becoming thick and solidified, but at no time did any of the carbolic acids act like the creosote and thicken or solidify at once. As a result of this work the writer would call the attention of the new committee of revision to the carbolic acid test as it now rests, suggesting that it be changed to "Coagulates collodion (difference from creosote)," and then on a distinct line say, "Coagulates albumin." It should go farther and under creosote say the same—viz., "Coagulates albumin." It would discredit the fallacy that the coagulation of carbolic acid by albumin is a means of differentiating between carbolic acid and creosote, for as both behave in exactly the same manner towards albumin, the test becomes one of identity (when associated with others) rather than of differentiation.—*Merck's Report.*

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NOVEL THEORY OF CANCER. An Australian physician, J. H. Webb, offers a theory of cancer that will be novel to a majority of the profession. He rejects the parasitic theory that has lately been so prominently to the fore, holding that thus far no sufficient evidence has been adduced to support it. Nor does he look to the microscope for the solution of the question of the origin of malignancy—"all the microscopes that were screwed up and down could never have revealed to us the connection between myxedema and the thyroid gland—one of the most important discoveries made in recent years." Supposing, he says, myxedema had been only recently recognized and our knowledge of the function of the thyroid still withheld, what a search there would have been after its germs! Taking what clues we have to the disease, he sees little to favor the irritation theory of the excitation of the irregular cell proliferation and much more to suggest a secretory derangement. All secre-

tions, he postulates, have their uses, and the plus or minus of any secretion beyond certain limits means disease. All reproduction requires control, or, given nutrition, it would be indefinite. There must therefore be something that limits the proliferation of the cell, and on account of its variability he thinks it can be only a secretion, which may be disordered in nature or in its control. If inhibition is lost and food supply continues proliferation becomes indefinite; hence there must be something in the organism that regulates the multiplication of the cell.

Cancer is the uncontrolled proliferation of one of the two ultimate tissue elements—cells and fibres. If one of these can lose its control it stands to reason, he says, that the other can do the same, and we find this in myxedema, which is uncontrolled proliferation of the fibre. We know that myxedema is due to defect of the thyroid secretion, and by analogy we should expect to find somewhere in the economy a similar body controlling cell proliferation, though the conditions are not exactly the same, since the cell, like a flask, can contain its own control. Reasoning thus, Webb turns to the liver secretion, the coincidence of gall-stones and malignancy, and our ignorance of the real function of the liver secretion suggesting the analogy. Mayo Robson and others have noticed this coincidence, and some have written of cholesterin irritation in the causation of cancer. Cholesterin, which Webb at first believed to be the controlling agent of cell growth, is isolated only in its crystallin state, that is, when it has become a morbid product. In the organism it is in solution and is kept thus by its own solvent soap. Under this impression, that cholesterin was the controlling agent and had become deficient, he tried injecting it hypodermically in cancer cases in solution with soap, at the same time administering thyroid. Later he has apparently used soap solution alone with the thyroid, and he reports some striking results as well as frankly acknowledges some failures. He reports two cases of epithelioma as cured and two more strikingly relieved; also one case of scirrhus of the breast and one of rodent ulcer cured. The cell element first disappears under the treatment, leaving the fibrous tissue behind, to be absorbed later.

It is not the lack of cholesterin that causes cancer, according to this theory; its crystals can be isolated from cancer discharges; it is the want of the saponifying agent in Webb's opinion, and he

thinks it is one of the functions of the liver to produce this. Both the ultimate elements, fibre and cell, enter into cancer, hence the use of the thyroid. The cell, it may be from an injury, "sheds its cholesterin, and the succeeding offspring acquire the habit," and this is where Adami's "habit of growth" hypothesis comes into play.

Whatever may be thought of this theory of the pathology of cancer, if Webb's diagnoses can be relied upon, and their apparent lack of pathologic verification suggests a possible doubt, the results reported by him are worthy of consideration in a disease that is so generally resistant to our best efforts. Any therapeutic suggestion that is not itself deadly is at least worth investigation in such an almost universally hopeless disease.—*Jour. Am. Med. Assn.*

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HEREDITY, WITH SPECIAL REFERENCE TO THE DIMINUTION IN SIZE OF THE HUMAN JAW. By J. Sim Wallace, M.D., D.Sc., L.D.S.R.C.S., London. That the human jaw is gradually becoming smaller is a fact which is universally recognized, but the cause of this diminution in size is not so very apparent. By those who believe in the transmission of acquired characters it is instanced as a case in support of their view. By those who deny this inheritance of acquired characters it is assumed to be explicable according to the principles they maintain; although, so far as I have seen, there has not as yet been an adequate explanation of the fact by them.

Before entering upon the discussion a few facts and figures may be useful. The size and prominence of the jaws may be indicated by Prof. Flower's gnathic index, which is well known, viz.: Basi-Nasal line $\times 100$; Basi-Alveola line = gnathic index, or shortly B.-N. $\times 100$; B.-A. = gnathic index. The following may be taken as examples: Prognathous, Native Australian. Gnathic index 104. Mesognathous. Chinese. Gnathic index 99. Orthognathous. English, Gnathic index 96. This gnathic index gives the relative sizes of the jaws to the head, and we need not concern ourselves with the absolute measurements. In the present inquiry the size of the jaws relative to the skull is of chief or sole importance. Another set of measurements which are perhaps less generally known is what Prof. Flower calls the dental index; that is, the relative length of a line taken from the posterior surface of the

crown of the third molar to the anterior surface of the crown of the first bicuspid (in the upper jaw) and the length of the basio-nasal line. If the former line be represented by d , the dental index will be as follows: $d \times 100 \text{ B.-N.} = \text{dental index}$. This index gives the sizes of the teeth relative to the general size of the skull perhaps better than any other measurement which may be devised. As instances the following may be taken—Microdont. British. Dental index 41.3. Mesodont. Chinese (male). Dental index 42.6. Megadont. Australian. Dental index 45.5. The basio-alveolar line is about 2 1-3 times the length of the dental line; and if we multiply the dental index by that number the result is approximately the gnathic index, i. e., the diminution of the dental and gnathic index is approximately identical. Thus, English $41.3 \times 2 \frac{1}{3} = 96.3$. Gnathic index 96. Chinese $42.6 \times 2 \frac{1}{3} = 99.4$. Gnathic index 99. Australian $45.5 \times 2 \frac{1}{3} = 106.1$. Gnathic index 104. To be somewhat more exact from the figures, it will be seen that the dental index diminishes rather quicker than does the gnathic index. This does not support the belief that the jaws diminish in size more quickly than the teeth. It might on *a priori* grounds be assumed that the size of the body of the jaws is directly correlated with the size of the teeth, and this we see is actually the case.

If now we compare the *position* of the teeth in prognathous races with that of orthognathous races, we observe that they are placed somewhat differently. A figure drawn from Owen's Comparative Anatomy and Physiology will show at a glance the more anterior position of the dental arch in the aboriginal Australian. It will be observed that prognathism is dependent on the prominence of the alveolus in the incisor region, on the more forward direction of the incisors, on the size of the body of the jaw, and on the more anterior position of the arches of the teeth relative to the body of the mandible and the bones of the face. Besides the differences already mentioned there is a considerable difference in civilized and savage races in the shape and especially in the massiveness of the mandible, due largely to the effects of muscular attachments and actions.

From the continued use of coarse and fibrous foods in savage races the muscles of mastication are greatly augmented in size. The amount of difference in this respect between the uses of the civilized and the uncivilized may be judged from the recent experiments

of Dr. Black, who finds that man living on "natural food would be able to close his jaws with a force of three hundred pounds, whereas in a civilized state and depending upon artificial preparation of foods the amount of stress that would be borne by the individual tooth without severe pain or injury is reduced to one hundred pounds or less in a state of apparent health."

A comparison of an aged jaw in which the teeth are lost with one in which the teeth are in full functional activity shows at a glance the parts of the mandible which are chiefly augmented by muscular development. The subserviency of the alveolus to the teeth is also seen. It will be seen that a large part of the angle of the jaw has been absorbed, and the anterior condyle is reduced in size. Not only are the changes shown in the figure brought about, but the massiveness of the jaw is reduced by at least one-half. A similar change is observed in those parts in the neighborhood of the insertion of the masseter, temporal and internal pterygoid in childhood and adolescence. That is, with the increase in size and strength of the muscles there goes an increase in length, breadth, and depth of the ramus, and this change takes place in proportion to the muscular development. It may be noticed that in the aged jaw the length does not diminish, and as I have said before, the length of the body of the jaw is largely dependent on the development and size of the teeth.

We are now in a position to point out the causes of the diminished size of the civilized jaws. There are three principal causes. (a) Diminution from muscular inactivity, or as it might be put with stricter accuracy, incomplete development from lack of the necessary stimulus of muscular activity. (This diminution is in bulk not in length, as above pointed out.) The incomplete development from this cause is of course generally recognized, not only in the case of the jaws but in all bones to which muscles are attached. The increased development from muscular activity is chiefly in the neighborhood of the attachments of muscles. It is difficult to say to what amount the jaw-bone might develop in the civilized races were it subjected to the muscular strain which is normal among savages. and, as this may be considered a point or the point at issue, it will perhaps be well in the meantime to limit our attention to what actually does take place. The comparison between the old and young jaw shows this sufficiently clearly. In

addition to the stimulus to growth of muscular activity we may add that of increased strain. It is known that the arrangement of the trabecula in long bones is due to the direction of strain, and this force no doubt influences slightly the development of the jaw.

The next cause of diminished prognathism in the civilized is (*b*) the more posterior position of the whole arch of the teeth, due to the diminished size of the civilized tongue. When the mouth is closed the tongue fills the cavity of the mouth, and thus the size of the arch of the teeth gives a fair indication of the size of the tongue. Measurements have been taken of numerous skulls, and a marked diminution in size in the civilized has been observed. It is well known that the position of the teeth is easily changed by mechanical means; if a slight continuous force is applied to any or several teeth they are moved till the pressure is equilibrated by an equal and opposite force. The whole system of the regulation of the teeth employed by dentists is dependent upon this fact. If a tooth or teeth are thus made to alter their position the alveolus adapts itself to the changed position. Since this is the case it is impossible for the teeth to be other than prognathous when the tongue is large, or vice versa. The question as to the cause of this enlargement of the tongue is simply that it, like other muscular structures, when it is much used develops more fully. I have pointed out elsewhere how very much more the tongue is used when coarse and fibrous food is masticated than when the refined foods of civilized peoples are masticated or swallowed. However, whatever be the cause of the diminished size of the tongue, the fact undoubtedly remains that it is smaller and that the teeth and alveolus occupy a position which is largely dependent upon its size.

The third principal cause of the smallness of the civilized jaw is (*c*) the size of the teeth themselves. That the teeth of the civilized are smaller than are those of the more savage races is established by actual measurement. The crowns of the teeth are developed in the substance of the jaw-bone, and it is known that the active development of surrounding parts is thus stimulated to growth. This is remarkably verified by cases in which the number of teeth is reduced in number: It is evident that this stimulus for the development in length of the body of the jaw is independent of muscular activity. It is important to observe that the teeth of the civilized have diminished in size, as they are passive structures, are formed

quite independent of use, and do not augment in size by functional activity. Nor is it maintained by "transmissionists" that such diminished size can be held to be due to inheritance of acquired characters. Thus Mr. Spencer, in referring to spines and other structures in plants whose functions are passive, says that this evolution is inexplicable except as results of natural selection. So, too, with structures having only a passive utility in animals he says he "never dreamed" that they were explicable as the result of the inheritance of functionally wrought modifications.

The diminution in size of the teeth by natural selection, however, presents a somewhat difficult problem. It may be questioned by some whether slightly smaller size of teeth can possibly have been of sufficient survival value to have caused the extinction of multitudes of men, and so to have brought about a diminution in the average size of civilized teeth. When we consider merely the extra weight of larger teeth, and the extra nutrition and muscle required to carry them about, we should certainly come to the conclusion that this has not been the cause of the diminution. It is not, however, always in a direct way that changes are brought about. Consider for example the case of such savages as the Australians. In them we find a relatively small cranial capacity, 1,197. Compare this with the cranial capacity of an Englishman, viz., 1,427. Remember that the cranial capacity of the remote ancestors of the English was no larger than that of Australian, and we see that assuming the size of the teeth to remain the same while the cranium increases in size, we have a certain advance towards the microdont type, for the basi-nasal line may be assumed to augment with the general augmentation of the cranium. The survival value of increased brain capacity will hardly be questioned.

Consider the matter from a slightly different point of view; assume that it is of considerable survival value that the brain of man should be highly developed and well nourished. A certain amount of nutrition flows along the common carotid; in one case let us assume that a larger amount is diverted to the cranium, and that this develops fully; in another that a larger amount goes to the teeth. It is evident that if the brain is of great survival value the teeth may suffer, those inheriting the one peculiarity surviving, while those inheriting the other become extinct. This latter assumption I have introduced more to indicate how indirect methods may effect

a diminution in size of the teeth rather than as an actual statement of fact as to the exact method which has in reality taken place. In addition to the factors which directly or indirectly may bring about a diminished size of the teeth, we may also have the factors panmixia and germinal selection.

Now what does all this indicate with regard to the size of the savage and civilized jaw? Simply that to a great extent its particular size is not due to heredity, but is largely a characteristic redeveloped in each generation as the result of the action of the environment. This is quite in accordance with the recent investigation of biologists. "Botanists and zoologists have conclusively shown that the bodies of animals and plants are subject to a very great change as the result of changes in the environment. Such changes are, indeed, not inherited, at least as a rule, but are simply redeveloped in each generation as the result of the action of the environment. Specific characters we have supposed to be inherited, but the more this matter is studied the more prominent has become the question as to whether most of the so-called specific characters, instead of being matters of inheritance, are not simply acquired by each individual." Much more strongly does this emphasize the fact that racial differences frequently are almost solely dependent on differences of environment.—*Dental Record*, Dec., 1901.

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EARLY EMBRYONIC DEVELOPMENT AND THE FORMATION OF THE MOUTH AND NOSE CAVITIES. By F. B. Noyes, D.D.S., Chicago. Read before the Chicago Odontographic Society. Our present knowledge of embryology has been acquired during the last half of the century just closed and is one of the results of the development of the cell theory. If we go back into the seventeenth and eighteenth centuries we find the most fantastic notions of development, all of which were purely speculative and necessarily so, for the means of investigation had not been developed in the higher forms of the microscope; and these fantastic notions were dispelled only by the improved means of observation. The subject as it stands today has been one of the phases of the development of the cell theory and we may well look to the development of thought in this line of biological study as an introduction.

Since the time of Schleiden and Schwann, who in 1839 announced the cell theory, a vast amount of work has been done, at first in the

analysis of the bodies of plants and animals, studying the forms and origin of cells making up the tissue, and later in the study of the functions and activities of the cells and their importance in inheritance and transmission.

We can perhaps not do better than to make a somewhat extended quotation from Prof. Wilson as a statement of the cell theory. He says (Introduction to "The Cell in Development and Inheritance"): "In all the higher forms of life, whether plants or animals, the body may be resolved into a vast host of minute structural units known as cells out of which directly or indirectly every part is built. The substance of the skin, of the brain, of the blood, of the bones or muscles or any other tissue, is not homogeneous as it appears to the unaided eye. The microscope shows it to be an aggregate composed of innumerable minute bodies, as if it were a colony, or congeries of organisms more elementary than itself. These elementary bodies, the cells, are essentially minute masses of living matter or protoplasm, a substance characterized by Huxley many years ago as 'the physical basis of life' and now universally recognized as the immediate substratum of all vital action. Endlessly diversified in the details of their form and structure, cells nevertheless possess a characteristic type of organization common to them all, hence in a certain sense they may be regarded as elementary organic units out of which the body is compounded.

"In the lowest forms of life the entire body consists of but a single cell. In the higher multicellular forms the body consists of a multitude of such cells associated in one organic whole. Structurally, therefore, the multicellular body is in a certain sense comparable with a colony or aggregation of the lower one-celled forms. From the physiological point of view a like comparison may be drawn. In the one-celled forms all of the vital functions are performed by a single cell. In the higher types they are distributed by a physiological division of labor among different groups of cells specially devoted to the performance of specific functions. The cell is therefore not only the unit of structure, but also the unit of function."

In the earliest work Schwann regarded the cell wall the important part and the soft substance contained in it as a waste product, because in important plant tissues such as wood it entirely disappears, leaving only the lifeless walls. Hugo von Mohl gave the name protoplasm to this soft substance; Kölliker, Cohn, Max

Schultze and others showed that the protoplasm was the essential part, as many animal cells—for instance, the white blood corpuscles, have no cell wall, and they also showed that the protoplasm contained within it a smaller vesicular body called the nucleus. In later years the knowledge of cell structure has advanced still farther, it being known that neither the protoplasm nor the nucleus are simple and final substances as they were supposed to be, but that they are, both chemically and structurally, complex. The nucleus is found to be made up of at least two chemically different substances, one of which, called the chromatin, combines with certain anilin dyes, showing the color, while the other, the achromatic, does not, but remains colorless.

By experiments with single-celled forms it has been shown that if the nucleus is removed from a cell it may continue to live for a time, the destructive changes going on in its protoplasm, but it will not assimilate food material, it will not grow nor divide, and sooner or later will die. It was also shown that when constructive changes are going on in the protoplasm of the cell, as in secretion of gland cells, there are also changes in the nucleus; and cells whose protoplasm is active contain large nuclei, often of complicated form, while those whose protoplasm is inactive contain small and vesicular nuclei except during division. From these and many other facts it may be stated that the nucleus exerts a controlling and directing influence over the constructive functions of the cell and its division.

The knowledge of the relation of the nucleus to the protoplasm has been still further developed, with the advancing knowledge of cell division. Cell division, as at first described by Remak and Kölliker, was a simple process consisting only in the division of the protoplasm and the nucleus, both of which they conceived to be simple substances, and could be described as the stretching in two of a lump of jelly. This division was more or less hit or miss and uncertain as to the parts received by the offspring from the parent cell. It was not until a much later time that the cell was shown to possess a complete mechanism for the exact and systematic division of the substances of the protoplasm and nucleus of the parent to the resulting cells. It required many years of labor to correct the mistaken notion of the enunciators of the cell theory, that the cells of the body may arise in development from a primitive and

structureless substance which they called the "primitive blastema," and prove the hypothesis clearly stated by Virchow in 1855, that every cell is derived by division from preexisting cell, making a complete line of cell divisions back to the single cell of the parent organism.

The later studies of cell division have shown that the chromatin of the nucleus, which in the functioning condition of the cell is usually arranged in the form of a network, in cell division first forms a continuous thread which shortens and thickens and finally breaks up into short "U" or "V" shaped pieces called chromosomes, which arrange themselves at the equator of the nucleus with the angle toward the center. The chromosomes then split lengthwise into similar halves and one-half moves toward one pole of the nucleus and the other to the other pole where separate nuclei are formed, the protoplasm dividing at the same time. This shows the beautiful mechanism for the distribution of the chromatin to the resulting cells, the importance of which is realized when we remember that this chromatin is to superintend all of the functions of the resulting cells, controlling the formative activities.

It has been shown that the number of chromosomes appearing in the cells of an organism in their division is a characteristic of the species and constant in all the cells of the body, and always an even number. And further, that the number of chromosomes in the germ cells is always half that of the cells of the body, so that in fertilization by the union of male and female cells (which constitutes fertilization) half of the chromosomes are of male and half female origin. These split longitudinally so that the two cells resulting from the first division of the ovum contain the full amount of chromatin equally derived from the male and female parent. These observations obtained in the working out of the cell theory furnished the demonstration of the evolutionary idea that the two sexes are equal in inheritance.

In all of the further development of the individual we must remember that the chromatin is to control the development and activities of the cell and by this mechanism of cell division called karyokinesis is systematically distributed, sending that which is to develop nerve cells to one part, that to develop muscle cells to another, so coordinating the development of various parts that when we see the development of the enamel-forming organ from one set

of cells we see at the same time the development of the dentin-forming organ from another set.

It would lead us too far and require too much time to develop all of the steps in the growth of biological thought which have brought the cell theory and the evolutionary theory together and which lie at the foundation of modern ideas of inheritance and transmission. I have endeavored to bring out enough to show that in the development of the individual there is a continuous multiplication of cells and a progressive differentiation, but all changes are systematically executed under a special mechanism. In this development from a single cell we will see that the individual passes through successive stages which correspond to the steps the race has passed through in its development, or ontogeny repeats phylogeny.

The fertilized ovum is a single cell, but it contains that which determines the entire development and all of the functions of the adult organism. It may therefore be compared to the single-celled animal, and at this stage the individual may be said to be in the ameba condition. This single cell divides into two, then four, then eight, and so on, and these divisions take place in a definite way, constituting the process known as segmentation. The cell being more or less spherical, the first division occurs as if by a plane passing through both poles dividing it into hemispheres, the second also through both poles at right angles with the first divides the hemispheres into quadrants, and the third at right angles with the other two, in a position corresponding to an equator divides the four cells into eight. This goes on, the lines of division following regular geometrical laws until the single cell is converted into a spherical mass of cells not very much larger than the original ovum.

In development, as might be expected, we find differences in various classes of animals. While they all follow a similar development up to their degree of perfection or specialization, in one certain evolutionary steps are most marked and recognizable, in others different stages are more clearly seen. In some animals, as in the chick, the ovum is provided with a great amount of nutriment material, so that the active protoplasm really floats on a sphere of non-living matter. In others, as the frog, the egg contains much yolk, but only enough to make the cells around one pole after the first few divisions much slower in division and so much larger than those around the other, leading to the first differentiation of cell form.

In man we find a similar condition, so that after the first few divisions the cells of the upper pole divide much more rapidly than those of the lower, and grow down over the others, inclosing them. When the large cells have been entirely covered in by the small ones, the latter continue to multiply more rapidly and fluid collects inside the sphere, leaving the large cells adhering to the inner surface of the small cell layer at one pole of the sphere. At the upper pole where the sphere is made up of two layers of cells there is an opaque spot or the "area pellucida," from only part of which the embryo is developed, the rest forming organs to provide it with nourishment during the embryonal condition.

Starting from the center of the opaque area on the upper surface of the sphere or blastula, there appears a streak known as the primitive streak, caused by the appearance of a rod of cells lying between the two layers, and from the side of this rod or notochord a third kind of cell different from either the large or small cell layer is formed. These three kinds of cells make up the three layers of the blastoderm and represent the first step in differentiation; or to state it in a different way, all of the chromatin which directs nerve cell activity has been sent to the outer small cell layer or epiderm, all of the chromatin which directs muscle cell activity, etc. has been sent to the new cells of the third layer or mesoderm, while the large cells of the inner layer or hypoderm contain chromatin to direct most of the secretory activities and the formation of the epithelium of the alimentary canal.

The epidermal cells on either side of the primitive streak grow rapidly, forming two ridges with a groove between them, which grows deeper and deeper until the ridges bend over and join, inclosing a tube which is to be the canal of the spinal cord. The anterior end of this tube enlarges into three bulbs which correspond to the ventricles of the brain, and as they increase in size they fold over ventrally or toward the center of the sphere till the first and second are at right angles to the original tubular part. As the outer layer forms the tube of the central nervous system, the inner layer folds off the blind pouch from the general cavity of the sphere which is to form the anterior part of the alimentary canal. By this time development is complicated by the formation of the embryonal membrane the amnion and allantois, but we may omit these entirely for our purpose.

The diagram from Quain's Anatomy illustrates the condition just described, showing the embryo in longitudinal section, the bending over of the anterior end of the neural canal to form the mid and fore-brain and the fore-gut or esophagus, a blind pouch ending anteriorly under the mid-brain and posteriorly opening into the cavity of the sphere now called the yolk sac. This pouch is lined by hypoblast and covered by mesoblast and epiblast. The heart has already begun its development in the mesoblast on the ventral side of the fore-gut.

There now appears what are called the gill slits, openings from the fore-gut through its wall to the surface of the embryo, which are separated by thickenings of the wall, forming arches around the gut known as the visceral arches, at the center of each of which is found a blood vessel. These structures are to be compared to the gills of a fish, which are slits through the wall of the esophagus to the outside so that water taken into the mouth may pass out through the slits. At this time, too, the arrangement of the blood vessels exactly resembles that of a fish and the individual may be said to be in the fish stage of development.

Quain's Anatomy and Hertwig's "Text Book of Embryology" show the embryo at this stage and the arrangement of the blood vessels. As the fore-brain grows ventrally the first visceral arch or mandibular arch also grows in the same direction, and the space between the inferior surface of the fore-brain and the upper surface of the first arch is the beginning of the mouth and nose activities, now called the stomodeum. From the base of the mandibular arch is seen also the rounded bud, which is beginning to grow forward along the base of the fore-brain to form part of the maxillary arch, and finally the upper jaw. At this time also the area which is to develop the sense of smell appears on each side at the outer and lower portion of the fore-brain. The olfactory areas grow out of the base of the fore-brain, at first being on the outside of the head and in the latter development being inclosed, leaving an opening to the surface, the nostril.

It will be understood that by the growing forward of the mandibular arch there is left an almost cubical space between the lower surface of the fore and mid-brain and the upper surface of the mandibular arch. This is a part of the outside world and is inclosed to form the mouth and nose cavities. This process is best understood

if we think of the development from the anterior end of the fore-brain of a process which may be described as a curtain dropping down, making a central piece, and the bud from the mandibular arch on each side growing forward to unite with it, leaving a slit between them and the mandibular arch which will be the mouth. In order to get a correct idea of this process it must be followed somewhat more minutely.

As the fronto-nasal process develops it is made up of four rather bulblike portions, two occupying the center which develop into the intermaxillary bone containing the incisor teeth and the center of the lip; and two side or lateral processes which grow out around the olfactory area and form the alae of the nose surrounding nostril. These do not unite again with the central parts, but the end stops over the point where the maxillary bud unites with the central process. A failure of union causes the deformity of harelip, the opening in the lip extending to one or if double to both nostrils.

When the central part of the fronto-nasal process has united with the maxillary bud on each side the arch of the upper jaw is complete and the original cubical space or stomodeum is inclosed, leaving only the slit between the maxillary and mandibular arches which is to form the mouth, but the inclosed space is in one chamber, there being no separation between the mouth and nose cavities. The time of this development in the human embryo may be placed at about the fourth week.

The separation of the mouth and nose cavities occurs by the development of horizontal ingrowths from the three parts making up the maxilla and beginning at the center and progressing backward. First a small triangular piece from the central part of globular processes of the fronto-nasal process, this uniting with the horizontal or palatal process of the maxillary buds on each side until these reach the apex of the triangle which will be the intermaxillary bone, just a little way back in the palate and from here backward they unite with their fellow of the opposite side. This is best seen by removing the mandibular arch and viewing the parts from below.

The deformity of cleft palate is then a later development than that of harelip and either may occur without the other, though they are usually found together. The cleft of the palate usually turns to one side at the front, running out between the cuspid and lateral unless

it is double, when a detached piece is found in the center in front containing the incisors.

As soon as the nose and mouth cavities are separated, and as fast as bone is formed in the septum, most of the space in the bone is occupied by the tooth germs. At birth almost all of the space between the roof of the mouth and the floor of the nose and the floor of the orbit is occupied by the developing teeth. The development of the face from birth to maturity is characterized by a growth downward from below the eyes, a baby's eyes being at the center of the face, an adult's in the upper third of the face. This growth at first accompanies or is caused by the growth of the permanent dentition, and as the permanent teeth are erupted the spaces that they occupied are converted into the maxillary sinuses.—*Review, Dec., 1901.*

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ASPHYXIAL FACTOR IN NITROUS OXID ANESTHESIA.

By T. P. C. Kirkpatrick, M.D., Ireland. Asphyxia may be defined as that condition into which an animal passes when for any reason the due oxygenation of its blood is interfered with. The condition is the result of the want of oxygen rather than due to the accumulation of CO_2 in the blood, for such an accumulation in the presence of a sufficiency of oxygen acts as a narcotic poison not unlike nitrous oxid itself. This, then, is the cardinal point which you must bear in mind: Asphyxial phenomena are the expression of the want of oxygen by the organism and the indication for treatment is clear and definite—supply oxygen, or, what is the same thing, atmospheric air.

When the supply of oxygen is completely cut off from an animal the condition of asphyxia develops and the symptoms which it presents are usually grouped into three stages as follows: First, the stage of exaggerated breathing or hyperpnea. The respirations are increased in frequency and depth, the inspirations being at first particularly prolonged and exaggerated. The respiration is accompanied by a distinctly audible sound, the lips get blue, the eyes prominent, and the blood-pressure begins to rise. This stage lasts for a minute or longer, according to whether the deprivation is gradual or sudden and complete, and gradually passes into the second stage, the chief characteristics of which are dyspnea or difficulty of breathing and convulsions. All the symptoms of the former stage become more marked, and soon the respirations become

convulsive, while the other muscles of the body are thrown into a state of clonic convulsions, or what in gas anesthesia is known as jactitation. This stage is slightly shorter than the preceding one, and the blood-pressure continues to rise considerably, while the cyanosis becomes very marked.

The third stage of exhaustion follows, the spasms give way, the muscles becoming relaxed, and the patient is insensible, with widely dilated pupils. The blood-pressure now falls rapidly below normal, and the pulse is scarcely perceptible, paralysis of the respiratory center takes place, and death ends matters. If the heart be examined at once after death, it is found that the right side with the pulmonary arteries and systemic veins is gorged with dark-colored blood, while the left side of the heart is empty, as are also the pulmonary veins and systemic arteries. Small hemorrhages may be found under the serous membranes.

This, then, is a picture of asphyxia, one which fortunately we seldom see in its entirety, but which in parts is common enough in gas anesthesia, how often you will recognize if you compare it with the anesthesia of nitrous oxid and oxygen, though the only difference between the two is the admission of oxygen in the latter and its exclusion in the former. When oxygen is administered with the gas we get an anesthesia characterized by a quiet, sleepy-like breathing, with a natural color, quiet pulse, relaxed muscles, fixed eye-balls and normal pupils. When you fully grasp the difference between these two conditions and recognize that it is due simply to the admission or deprivation of oxygen, you will be in a better position to appreciate the signs of asphyxia, even in the slightest degree, and so either avoid it altogether or keep it properly under control. When you are able to do this you will be able to avoid what is by far the commonest cause of all the accidents and untoward circumstances which are likely to arise from the administration, not only of nitrous oxid, but also of ether and chloroform. Your anesthesia will in every case be better, and should an accident arise your patient will be in a far better position to meet it than would be the case were the asphyxial factor also added to the danger.

Let me now try and illustrate these principles by a few examples, and point out to you some of the Protean forms in which this asphyxial element appears in actual practice. There is no difficulty in recognizing it when it appears in its native hideousness, as was

the case in the old method of gas-administration. Here oxygen was excluded till the patient had passed well into the second stage of asphyxia; then the operation was begun, and by the time the asphyxia had passed off the patient had regained consciousness. Experiments have shown that after breathing nitrous oxid for a period of 105 seconds the oxygen in the blood is reduced from 21 to 52 vols. per cent. in other words, more than three-quarters of the oxygen in the blood had been used up by the tissues, and since oxygen is essential to the life, not only of the organisms as a whole, but to each cell in that organism, you see how near death a patient may be brought by this method of administration of gas. If, then, after such an administration the respiration ceases from any cause there is but a small margin of time during which it is possible to restore the patient. Fortunately, in the vast majority of cases this margin, though small, is sufficient, and by artificial respiration it is possible to introduce a fresh supply of oxygen. In such cases the signs are so evident and so aggressive that there is no possibility of mistaking them, and no difficulty in recognizing what treatment is necessary. The success of this treatment, however, depends on the fact that usually the action of the heart continues in spite of the cessation of the respiration, for not only must the oxygen get to the blood, but also the oxygenated blood must get to the tissues, and especially to those tissues the integrity of which is essential to life—that is, the great nerve centers of the medulla. One of the conditions of asphyxia, however, we have seen is that the right side of the heart becomes distended with blood while the left side becomes empty. The empty ventricle, however, cannot contract, and in the distended ventricle the force which is necessary to expel the blood increases as the cube of the radius of the cavity, so that the work thrown on the heart is greatly increased. If the heart is healthy it may be able to meet this extra strain, but if it be debilitated or degenerated it may be quite unable to do so, with the result that death takes place.

In the earlier stages of asphyxia we have seen that there is a very considerable rise in blood-pressure. This means more work for the heart and considerable strain on the walls of the arteries. If the arteries are degenerated, as is so commonly the case with old people, they may rupture, and possibly a fatal cerebral hemorrhage results, as has actually been recorded in practice, and hence old age has

been given as a contraindication for gas anesthesia. The only remedy here, it is needless to say, is prevention.

These are extreme conditions and fortunately, not commonly met with in practice; there are, however, others, not so dangerous perhaps, but sufficiently objectionable to justify considerable trouble to avoid them. As such may be mentioned the jactitation so commonly met with in gas anesthesia, and which is so inconvenient to the operator. This is really the clonic convulsions of the second stage of asphyxia, and may easily be abolished by the simple expedient of allowing the patient more air. There is another phenomenon, perhaps more annoying, but which is not so well recognized as due to the want of oxygen. I refer to the struggling often met with in the earlier stages of the administration before the patient is "off." You are all familiar, by reputation at all events, with the struggles of the drowning man—that is, the violent conscious efforts which are stimulated by the feeling of smothering or want of oxygen, the feeling that one must get air at any cost. I am convinced that the cause is the same in the two cases—the want of oxygen. This struggling is not so commonly met with during the administration of nitrous oxid as it is during that of ether, for the simple reason that in the case of the former consciousness is usually abolished before the want is felt, while in the latter it is not. In proof of this I have found that in the case of men who often require a considerable quantity of gas to anesthetize them struggling is likely to take place. Hence the old teaching was that the way to subdue these struggles was to press the anesthetic; whereas the truth is they can be much more quickly, effectually, and pleasantly abolished by the admission of some air. This I have found to be true after some bitter experience in my own practice, and now always endeavor to anticipate their onset either by a rapid anesthetization with gas or by free administration of air with the anesthetic.

In many cases the only evidence of asphyxia which will be present is the great increase in the frequency and depth of the respirations—that is, the hyperpnea of the first stage. It is, however, very important to recognize this, not only as a warning of what will certainly follow if it is neglected, but also because often this overstimulation of the respiratory center is apt to be followed by a period of apnea or absence of respiration, which before it passes off may induce a very profound degree of asphyxia, causing consider-

able trouble and alarm. I have seen patients in this condition become almost black in the face, to the great alarm of the bystanders, before respiration was again reestablished. Under ordinary circumstances the condition is devoid of danger, but in the case of a weak heart or degenerated vessels it might possibly lead to a fatal result; besides, in my experience it is almost always followed by very violent headache after recovery.

Many of you will have found, when beginning extractions under anesthetics, that the swollen state of the tongue considerably impedes your manipulations in the mouth. This condition results from the fact that in the conscious state the muscles of which the tongue is composed are in a state of tonic contraction, while during anesthesia they are more or less relaxed. Now asphyxia, even in slight degrees, leads to the stagnation of the blood in the veins, and thus in the tongue the swelling due to the relaxation of the muscles may be greatly increased, so much so that any operation in the mouth is rendered very difficult. This venous congestion also favors hemorrhage from the sockets of the extracted teeth, which further obstructs the operator. This is a matter of no little importance when the time available for operation can be counted only in seconds.

I have said perhaps enough to convince you of the advisability of avoiding the asphyxial element in anesthesia, and these remarks apply with as much force to the administration of ether as of gas, while in the administration of chloroform any asphyxia is attended with great and special risks. In the case of nitrous oxid anesthesia it is not always possible to avoid it altogether, and often it may be advantageously made use of as a help, but this should be done only knowingly, and in so far as it is possible to keep it properly under control. In many cases it is not easy to get a sufficient depth of anesthesia without it—that is, to administer enough gas to anesthetize the patient while at the same time we give enough air to supply his oxygen needs. This was the reason why the introduction of nitrous oxid and oxygen anesthesia was such an improvement on that of pure nitrous oxid. You will remember that the atmospheric air contains some 79 per cent of nitrogen, which for respiratory purposes is absolutely useless, so that to give 21 vols. of oxygen one must give 100 vols. of air. It is not at all an easy matter to give this large quantity of air and still give enough gas

to maintain anesthesia, so that a slight limitation of the oxygen may not only be useful but necessary. This should be done, however, only with a full knowledge of its effects, and the limitation should never be permitted to go till the dangerous symptoms of asphyxia rise.

As regards treatment, the indications are plain and unmistakable. Supply oxygen either by permitting the patient to freely breathe air, or by compelling him to do so by means of artificial respiration if the natural function is in abeyance. In order to accomplish this it is necessary to see that the air-way is free and unobstructed, either by the tongue falling back, or by blood or other foreign body in the air-passages. As long as the circulation is maintained and the air-way clear, one or two respirations are sufficient to lessen the cyanosis and indicate the onset of recovery. If this does not at once take place, you may conclude that either the air is not entering the lungs or that the heart is not driving the oxygenated blood into the peripheral arteries. Thus, if the pulse continues to beat, you are justified in the conclusion that the air is not passing into the lungs, and that either there is some obstruction in the air-passages, or your method of artificial respiration is inefficient. In the former tracheotomy should be performed at once unless the obstruction can be removed, as any delay is attended with the greatest risk. If it is the circulation that is at fault, tracheotomy is worse than useless, being absolutely harmful and adding a further and unnecessary shock to the patient. The condition will in this case be the result of one or two causes—either syncope from the want of a sufficient supply of blood in the heart and great vessels, or obstruction of the heart from overdistension. It is of great importance to diagnose which of these conditions is present, as the treatment of each is diametrically opposed. This diagnosis in many cases is by no means easy, but with due care and attention can generally be made. If the condition has arisen early in the administration after struggling, and is attended with marked congestion of the face and deep cyanosis, the probability is that the case is one of overdistension; while if it occurs later after the administration has continued for some time, and then comes on suddenly without warning, being attended with pallor rather than cyanosis, it is most likely due to syncope. In the latter case complete inversion of the patient is the best remedy, while if there is overdistension of the heart this pro-

cedure will only aggravate the condition. In cases of overdistension one should endeavor to empty the heart by intermittent pressure over the precordial area, and possibly open one of the jugular veins, artificial respiration being kept up continuously in each case. Drugs here are probably quite useless, for if the circulation has stopped it is impossible to convey them to the organ on which it is wished that they should act. Electrical stimulation is also useless, for if it reaches the heart at all, which is doubtful, it would probably inhibit its action. From this you will see that the curative agents at our disposal are not very numerous, nor are they very efficacious; hence there is all the more reason for avoiding the necessity of using them by proper preventive treatment.—*Dental Record*.

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PASSING AWAY. Take a walk through any of the cemeteries throughout the country and you will believe with us that fools are slowly but surely passing away.

With silent tread you pass the last resting-place of the individual who blew into an empty gun.

The modest tombstone of the hired girl who lighted the fire with kerosene, and the grass-carpeted mound that covers the mortal remains of the boy who took a mule by the tail.

The tall monument of the man who didn't know it was loaded overshadows the dug-out of the man who jumped off the cars to save a ten-rod walk.

Side by side lie the remains of the ethereal creature who always kept her corset laced up to the last hole and the intellectual idiot who rode a bicycle nine miles in ten minutes.

Here reposes the young doctor who took a dose of his own medicine, and the old fool who married a young wife.

Right over yonder in the northwest corner, where the gentle breezes sigh through the weeping willow that bends over his lowly bed, lies the fellow that told his mother-in-law she lied.

Down there in the potter's field, with his feet sticking to rude blasts of winter and blistering rays of summer's sun, is stretched all the earthly remains of the misguided regulator who tried to lick the editor, while the broken bones of the man who wouldn't pay for his paper are piled up in a corner of the fence.

Near by, his grave unmarked, reposes the moldering dust of the printer who starved to death trying to run a first-class paper in a fourth-class town.

Over by the entrance reposes the boy who went swimming too early in the season, and the old lady who kept strychnin and baking-powder side by side in the cupboard.

Right there in the path directly in front of the entrance, obstructing the way, is the grave of the microbe-killer who rinsed himself inside and out with antiseptic solutions until his agonies were cut short by acute softening of the brain.

The fool-killer gathers them in, one by one, and by and by we will have a pretty decent world to live in.—*Ex.*

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ACIDS OCCURRING IN THE MOUTH. By H. H. Boom, M.D., Philadelphia. When the mixed saliva, normally alkaline, possesses an acid reaction, the acidifying substances must result, either from processes of fermentation of substances retained in the mouth, or from a true glandular secretion entering the mouth. Fermentation of food particles in the mouth is brought about through the exciting presence of certain bacterial organisms. The variety of fermentation induced, and the products resulting, will be determined by the character of the food particles and the nature of the bacterial forms present.

Dr. Willoughby Miller, in his work, "The Microorganisms of the Human Mouth," states that of twenty-five varieties of bacteria occurring in the mouth, sixteen were found capable of occasioning fermentation of carbohydrates, with the production of acid results.

Lactic Acid.—Of the acids resulting from fermentation of carbohydrates in the mouth, this is the one occurring in the largest quantity and possessing the greatest interest to the dentist. Lactic acid, $C_3H_5O_3$, is best known as the acid of sour milk. The pure acid is a colorless, syrupy, strongly acid liquid. It is without odor, and has a marked affinity for moisture, which it readily absorbs from the air. It mixes readily with ether, alcohol and water. There exist several varieties of lactic acid. One of these varieties, known as paralactic or sarcolactic acid, obtained from meat, turns the plane of polarized light towards the right. Another variety, resulting from a peculiar fermentation of sugar, is identical in every respect with paralactic save that it occasions left polarization. Lactic acid results from the fermentation of many vegetable substances, and also from meats. It is interesting to the dental operator, as it is produced in larger quantity from fermentation of food particles in

the mouth than is any other acidulous substance. Its relative proportion in saliva has never been found to exceed .75 of 1 per cent. The production of lactic acid through fermentation occurring in the mouth is generally accompanied by the formation in much smaller quantities of certain other acids, among which formic, acetic and butyric acids are best known.

Quoting from Dr. Miller's work: "A particle of starch introduced into the oral cavity would undergo about the following successive changes: In the first place, it is, in part at least, transformed into grape sugar by the action of ptyalin of the saliva. This grape sugar in turn is split into lactic acid through the action of various bacteria in the mouth. The lactic acid unites with the lime of the teeth or tartar, forming lactate of lime." The latter may then undergo various fermentations, giving rise to new acid products and to the formations of the corresponding lime salts, from which, by still other processes of fermentation, acids are again produced.

Diathesis.—When the acidity of saliva does not arise from local fermentative action, we may by the use of litmus detect a positively acid secretion issuing from the labial and buccal glands and pouring directly into the oral cavity. Such instances afford a symptom of a general constitutional condition, which condition present is generally an inherited one, and is known as "diathesis." The medical profession recognize a number of these so-called diatheses of personal predispositions to certain special diseases. Thus we study the tuberculous, the gouty, the rheumatic, the scrofulous diathesis, etc. In many of these diatheses we find an increased acidity of all the fluids of the body. This is particularly true of the rheumatic and the gouty diathesis. It has been well established by careful observation that in both the rheumatic and the gouty diathesis the underlying pathological condition is the diminution in the number of the red blood corpuscles, and an apparent increase in the number of white blood corpuscles. Now, if the number of red blood corpuscles be decreased, we would have a lessened quantity of oxygen carried from the lungs to all structures of the body.

Theory of Acidity of Saliva.—Through this deficiency of oxygen the waste products, especially the albuminoids, fail to be completely converted into the normal excretory substance urea; but in its stead uric acid is formed and passes into the blood. When uric acid enters the alkaline blood it probably unites with sodium to form

the neutral sodium urate, $\text{Na}_2\text{C}_4\text{H}_3\text{N}_3\text{O}_9$. From a general deficiency of oxygen all cellular structures suffer, so that waste products of the cells throughout the body are but imperfectly removed, and carbon dioxidate accumulates in the cell instead of being carried away to the lungs by the red blood discs. If we dissolve neutral sodium urate in water in a test tube, and pass a current of CO_2 gas through the solution, the neutral sodium urate at once changes to acid sodium urate, the reaction being $\text{Na}_2\text{C}_4\text{H}_3\text{N}_3\text{O}_9$, plus 2CO_2 , plus H_2O equals $\text{NaHC}_4\text{H}_2\text{N}_3\text{O}_9$, plus NaHCO_3 , plus CO_2 .

Now we have the same conditions present in the living cells throughout the body as are present in the experiment. The cell contains CO_2 , not removed through a deficient carrying capacity of the fewer red blood corpuscles. The cell contains neutral sodium urate as a deposition from the blood. Moisture is present, so that all conditions are favorable to the formation of acid sodium urate, and we can safely assume that this substance is so produced.

We now find present in the cell acid sodium urate, acid sodium carbonate, an excess of carbon dioxid and moisture. Separated from the cell by the thin capillary wall circulates the blood, containing neutral sodium phosphate. This being readily diffusible, passes from the blood through the capillary wall into the cell, and coming in contact with acid sodium urate it at once undergoes conversion into acid sodium phosphate, and as such, in the case of the labial glands, is at once poured into the oral cavity. The reaction here taking place would be represented by the equation: $\text{NaHC}_4\text{H}_2\text{N}_3\text{O}_9$, plus Na_2HPO_4 equals $\text{Na}_2\text{C}_4\text{H}_3\text{N}_3\text{O}_9$, plus NaH_2PO_4 .

The newly formed acid sodium phosphate, readily soluble, at once passes from the labial glands into the oral cavity. The difficultly soluble neutral sodium urate is retained in the cell structure to be there acted upon by carbon dioxid and moisture, and to again revert to the form of acid sodium urate to again act upon an additional quantity of sodium phosphate from the blood. Upon this chemical act the acidity of the saliva largely depends.

We make the broad statement then, that in pathological constitutional conditions, although we may find uric acid, acetic acid and other organic acids present in saliva, the acidity of such saliva is largely due to the presence in it of acid phosphate of sodium. This is offered as a theory, the truth of which chemistry seems to sustain.

—*Items, Jan., 1902.*

Letters.

DR. BLACK REPLIES TO QUESTION ABOUT "PULP AND DEVELOPMENT OF THE TOOTH."

CHICAGO, Jan. 29, 1902.

To the Editor of the Digest,

MR. EDITOR:—Regarding the question on page 69 of the January DIGEST I would say, that if the pulp of the tooth is destroyed the apex of the root will not be completed, nor will the apical foramen be reduced to what would be the normal size in the adult tooth. On the other hand, if alveolar abscess can be prevented (a doubtful case) the eruption of the tooth will probably be completed and it will resume its proper position in the arch.

In answer to the question as to the best method of procedure in the case presented, I would say: First make an accurately fitting gold cap that will cover the incisal half of the crown and cut out the mesio-incisal angle sufficiently that treatment and filling can be made through the opening. Then cement this to place, protecting the pulp against pressure. Through the opening in shell make such treatment as may be necessary, cap the pulp and fill temporarily. The gold cap will securely hold the pulp-capping and the temporary filling. If the pulp is retained alive and healthy the apical portion of root will be completed by the time the lad is ten or twelve years old, the pulp-chamber and canal will be reduced to normal size for that age and the exposure recovered with normal dentin. Then or later the case can have a permanent filling.

Yours truly,

G. V. BLACK.

DR. NOYES REPLIES TO QUESTION ABOUT "PULP AND DEVELOPMENT OF THE TOOTH."

CHICAGO, Feb. 3, 1902.

To the Editor of the Digest,

MR. EDITOR:—In reply to your correspondent, page 69, in January DIGEST, I would say: The chief if not the only function of the dental pulp is the formation of dentin, and no other organ or tissue appears able to perform its office vicariously. It therefore follows that after loss of the pulp no more dentin will be formed. The development of the cementum and periodontal membrane follows or

accompanies but does not precede that of the dentin. In order therefore that the development of a tooth may proceed after the loss of its pulp, there must have been previously formed at least an external layer of dentin throughout the whole length of the root to its apex. If development of dentin has proceeded to that extent, and the disturbances caused by loss of the pulp have been followed by a return to health of all the other tissues, then further development of the cementum and peridental membrane may proceed.

In the case cited, every possible effort should be made to save the pulp alive, by preserving it from infection if possible, or if that has already taken place or is suspected (and it must be suspected unless protection was applied almost immediately after the fracture), by counteracting the infection by non-escharotic antiseptics, and the efficient protection from subsequent danger of infection and from every source of irritation.

Before the development of the root is complete the pulp-vessels enter by a channel as wide as the pulp itself, and there is no danger that it will be strangulated by hyperemia. It is also at the summit of its functional activity and will live through much harder usage than at a later time when the most important part of its life work has been completed. There is great encouragement to make every effort and take all chances that are unavoidable for the preservation of such pulps. A pulp should never be destroyed in a tooth the root of which is not fully developed. If it dies we must then do the best that circumstances permit, but we should never have to answer for killing it. In the case cited the root must be so incomplete as to make the loss of the tooth certain if the pulp is lost or destroyed soon after the accident.

Yours truly,

EDMUND NOYES.

THE BOSS TRIES ADVERTISING.

(AS TOLD BY THE OFFICE BOY.)

We was havin' a Dull Spell in the Offis one week in House-Cleanin' time, an' the Boss says he, "James, when business gits dull like it is now, blamed ef I ain't a mind to try advertisin' fer a change. The code of Ethics says you mustn't but dern the code of Ethics. The nearest I kin make out of it is that the code is intended to keep back the young fellers till all the old ones is dead an' beyond needin' any business. So I say, dern the code of Ethics;

Give us all an equal Show. It ain't no wuss Advertisin' than it is settin' about to build up Practice by underhand methods o' runnin' other dentists down. I ain't never tried advertisin', but it seems to me a nice, neat, modest advertisement wouldn't be so Bad. Blamed if I don't try it sometime, James."

Jist then the bell rung, an' it was Funny, but who should it be but a man that said he wanted me to call the Boss out, no matter what he was a-doin', fer he represented the Blue Book, an' he was under strict orders not to pass Dock Contour by, no matter ef he didn't git no other dentist in town. So I told the Boss it was somethin' he wouldn't want to miss, an' he throwed away his Cigar an' went in the Hall, where the man was. Says t he Man, "Doctor Contour, I believe? I've knowed you fer years, by sight, an, once you pulled a baby tooth for my little Girl. It had growed Crooked, or something, an' Dock Peabody acrost the Street, he said it orter be let be, but the Minute you seen it, you said it orter to come Out. Me an' you was Agreed on that, an' my Wife she pulled agin it, sidin' with Dock Peabody, an' I reckon it was about a half Hour before me an' you could make her Give In. An' then after it was Out, she wouldn't consent to your'"—

The Boss he interrupted him jis' then. Says he, "Yes, I remember all about it. It happened on the umphteenth day o' December, seventeen year ago, about six o'clock P. M.. Oh yes, I recall that distinctly. In fact I ain't thought about nothin' but that pertick'-ler tooth, ever since. An' after it was out you told me about how yourself had a Dentist that didn't understand his' business try to pull a Tooth fer you, an' he give three Jerks an' had to stop an' Rest, an' you set there never movin' a Muscle, lettin' him do jis' whatever he Pleased. An' after he got it out the Roots brung away a big piece o' the Jaw Bone that had growed 'round. An' the Dentist said he never in all his Born Days seen sech a case. You was about a Hour tellin' me the Pertick'lers, an' you never charged me a Cent fer what yon'd Learned me about Dentistry. I remember the hull business, distinc'ly."

The Boss he wore a Pleasant Smile, while he was 'Talkin,' yet somehow I got the Idee in my Head that he'd like to kick the gentleman through the Transom. Then he went on: "After you'd wore me out you said, what was the charge for pullin' Baby Teeth, like it hadn't orter be Mutch, an' I said fifty cents. You said you'd 'rop in the Nex' Day an' pay, but you never Dropped."

I seen right away, from the Guilty Look on the man's face, that what the Boss was a-sayin' was likely enough True, only it didn't happen so Long Back. The Boss has a Way of Exaggeratin', when he wants to be reel Funny, an' he didn't mean it was Seventeen Year back, Reely. So the man bein' three or four sizes smaller than the Boss, he began to Cry, an' says he, "That wasn't me, Dock after all. I forgot; I've got a Twin Brother that looks as mutch like me as Two Peas, an' you hadn't orter put things on me that he Reely Done." So the Boss he apologized, after the Man had explained a lot more, an' he let on like he was convinced it Reely wasn't him at all, yet I could see he wasn't Fooled wuth a Cent.

So d'rec'ly the man he Wiped his Eyes, an' said he, "After all I'm glad all that you've been a-tellin' me, happened, fer it does seem like a Special Providence has put it in my way to make Amends fer my Wicked Brother's wrong doin'." He stopped a Minute to Sop his Eyes, an' then went on: "*The Daily Globe*, the leadin' Journal of this City, sent me here to interview you relat' to Dentistry. The *Globe* has got a Idee that it orter lend a Hand in the business o' Elevatin' the Dental Perfession, from Heerin' the subject discussed in your Dental Conventions. It wasn't only this Morn'ing that the Honorable Silas Manson, late member of Congress, an' now Editor of the *Globe*, says he to me, 'Anderson, (he always talks familiar to me, 'cause he's knowed me an' all my Folks so long), says he, 'Anderson, they's one thing been on my Mind for Months an' I ain't never reely got Time to attend to it. An' even now I ain't got the time, an' so I must ast you to discharge the Duty fer me. Says he, they's a poor, strugglin', deservin' class o' Perfessional Men in this city that's long been conspicuous in the Public Eye, fer the onselfish manner in which they've served the community. I'd like to see them rewarded by helpin' them take a higher place on a True Plane of Perfessional Fellowship with the older Perfessions. I understand they's a Organization just been organized, to publish a Blue Book, a kind of Exclusive society directory, containin' only the Elite of the City. Now I've conceived the Notion that they ain't no Class o' Perfessional men better entitled to a place in that Blue Book than the Dentists. But I find that the reel Obstacle to their gettin' in, is that they ain't quite well enough Known. That's too Bad, but it ain't beyond Remedyin'. Let's make 'em known. I'm willing to do my share in this Noble Work;

I'll give a page o' *The Daily Globe*, gratis, for one day, to be took up exclusively by descriptive sketches, biographies, an' so on, of the leadin' dentists of this City. The *Leadin'* dentists, you understand, Anderson. Don't you let me ketch you bringin' into this Offis any names o' snide dentists. Mind you; you're a Old Friend o' mine, an' I wouldn't want to do you no Harm' but if you fetch me any names of any but the Very Exclusive an' Leadin' dentists of the City, I'll throw you out of the window. An' whatever is wrote up about them has to pass my personal censorship. I won't allow any but the ablest of my Editors to do the writin', and you're to see that nothin' but facts given by the dentists themselves is submitted. Now go, an' be Offul Careful what you're about. So as I was leavin' he called me back. Says he, 'I'd recommend that you go first of all to a few of the reely representative men, the cream o' the Perfession, such as Dock Contour, an' Dock Puffy, and Dock Hotty. That feller Peabody, right acrost from Dock Contour ain't no Good. You see that you leave him out'."

The Boss he was Smilin' all over by this time, but it seemed like he wasn't willin' to Jump without takin' a Squint er two. Says he, "In the first place, I don't approve o' advertisin'. I ain't never done it, an' it might excite comment if I was to begin now." Then the man he looked kind o' Injured, an' says he, "Who mentioned Advertisin'? This ain't advertisin'; it's jist a rare chance to put yourself on Record as a dentist totally opposed to the Class o' Humbug Dentists what *doos* advertise. I'm afraid you don't quite appreciate the Favor our Mr. Manson is offerin' to do you personally, an' the body of the Perfession represented by yourself."

So that seemed to make it all right with the Boss, only he ast one more question; says he, "What's all this here likely to Cost me? I ain't one o' the kind to buy a pig in a poke." Says the gentleman, "Of course our editor, Mr. Manson, he wouldn't want to charge a cent, seein' as he's disinterested in the Matter, an' only aimin' to Raise the Dental Perfession up where it had Orter Been long ago. However, the las' thing he said to me was this: says he, 'Anderson, human nature is a Curi's Thing, an' it'll Pay you to Study it every time you git a Chance. Now here, for instance, you've got a Fine Chance. If you was to go to them Dentists an offer them a place in our Blue Book an' in our Paper, fer nothin', they'd imagine right away, it wasn't no Good. But if you say to them, it's goin' to cost

you Ten Dolers, they'll think it's something worth while. An' I'd recommend you to ask fer the Ten Dolers in advance, fer this reason:—the other dentists you go to after seein' such men as Dock Contour an' Dock Puffy, noticin' that they've subscribed an' Paid Up, will see right away what a Rare Chance it is, an' you won't have to spend no Time explainin' all the Details, like you may need to do when you see Dock Contour. It's a Suggestion at Least. It's somethin' us Congressmen Learned when we was in Washington; always aim to save Time.'"

The Boss he seen what a Fine Thing it was, an' so he told the man how he come to go into Dentistry, an' how long he'd been practicin', an' a lot o' stuff fer him to Take Down. The gentleman he promised to use lots o' Discretion an' Delicacy in writin' up from these notes the Article he intended to Publish, an' he reminded the Boss how every word had to be inspected by Mr. Manson himself, an' he'd be mighty pertick'ler, seein' it was finally all to go in the Blue Book, an' he said it would appear in the nex' mornin' Paper, an' in the Blue Book about a Week later. The Boss he writ a Note then, an' he told me to take it over to Dock Peabody, and I Done It, an' Dock Peabody, said he, "Dern this everlastin' borryin' from me an' never Payin' Back for Three Months!" an' he looked Offul Sour, an' thinks I, blamed ef I ain't more'n Haf in Sympathy with them sentiments, but I didn't say nothin' an' after a long Spell o' thinkin' how he could Git out o' it, I reckon, he Peeled Off a ten doler Bill from a wad, an' I took it back to the Boss. He give it to the Man, an' says he, "I hope that'll bring me some business, fer I need it," an' the man, says he, "ef this here don't bring you a Thousan' Dolers before a Month, I'm a Phillippino Squaw." Then he went away.

Well, the nex' mornin' sure enough, here was the Article, coverin' a Page of the *Daily Globe*. I took the paper in the Laboratory, where the Boss was soakin' a Corn an' cussin' under his Breth. He was Offul interested, an' he couldn't wait till he'd got done an' dried his Hands, so says he, "you jis' read it, James; go kind o' slow, so as we kin Drink it in, an' you won't make no mistakes." So I begun with readin' the headin'. "It's got the Title at the head of the page," said I. "It's in great big letters, readin', 'Denistry.'" "What's that, James? Read that agin," said he. So I read it, 'Denistry.' An' says he, "Nonsense, James, you read that right,

now. What's the matter of you! Dentistry is the word, D-e-n-t-i-s-t-r-y is the way it's spelled." Said I "That's all right, but this is spelled 'D-E-N-I-S-T-R-Y,' You can see as good as me." The Boss snatched the Paper out o' my Hand, reel Impatient. "What's the matter of you, James; you'd orter go back to school an' learn to read. This is Disgraceful!" says he.

He put on his Glasses an' then he tackled it. "Dern my Buttons, James, ef it *ain't* Denistry! An' here the first Thing is the Article about me Say, James, somethin' tells me in Advance, I ain't a-goin' to like this! Listen, it says: 'Dock Contour is perhaps the oldest practitioner among the Dentists in this City.' Oh Thunder, James, an' me only thirty-seven years old!" The Boss groaned Offul. It reminded me of my uncle's Hoss on the Farm, when he got in the Oat-Bin one night, an' he was so Swelled Up in the mornin' they couldn't git him through the Stable Door, an' he lay there a-Groanin' an' nearly Bust. "People readin' that, James, 'll say right away, 'I knowed it; he can't see no more; that's why my Fillin' come out!' Let's see what else it says, James. Listen here—'Dock Contour is the Peer of any Denist of this City,—(*Denist*, James!) an' when it comes to the question of Price, he don't allow no Dentists to come near him. Best quality, low Prices, is his Motto."

The Boss quivered like he was a-goin' to Faint. "Oh James, this is Offul! I feel Sick, James. Go in the closet there an' bring me out that Bottle o' Tonic, on the shelf. It's red-lookin' Stuff, James."

So I brung the Bottle, an' the Boss he filled a Glass with it, an' says he, loòkin' solemn, "This is Poke-Berry juice, James. It's a fine Tonic for Men. But it's Offul Pizen for boys. You know all about that, I reckon. Don't you ever ferget an' Taste this, James." Then he Drunk it. It seemed to help him, for he took up the Paper agin, presently.

"I ain't a-goin' to look at this about me, any more, James. But how's this here? I don't see nothin' about Puffy, nor Hotty, nor even Dock Measley. Say, James; this here is gittin' Wuss and Wuss! Oh Horrors, James! here's the Atchison *Painless Dental Parlor* an' the *Washington Dentists' Boudoir*, an' the—James, will you listen to this." (He was lookin' at the Article about himself, agin.) "It says, 'menny is the Old Man an' Woman a-goin'

about the streets of our City with a Set o' Doctor Contour's Cheap Teeth in their Mouth! Say James; You git my Lead Mallet out o' my instrument case, an' you tap me one on the Gong, fer bein' the Blamdest Fool Dentist in the Perfession! O, a-hoo!"

I thought at first he was a-goin' to Vomic, but he didn't, only he slid down in his Cheer an' shet his Eyes like he wanted to Forget everything. So I got the Mallet, an' I come up behind him, an' I hit him one not so Offul hard, about hard enough to drive a Tack, right on his Bald Spot. An' he give a Yell, an' to my Surprise he slid down clean on the Floor, groanin' an' rubbin' his head like he was Hurt. I seen he was too, an' bein' Scairt I run to his case an' got a bottle o' Creosote, an' then I remembered him a-sayin' about it not agreein' with some folks, on account o' their idiosyncrasy, or somethin', so I didn't only pour on about a Teaspoonful. It seemed to act the Funniest on him; the big purple spot turned kind o' Gray, the creosote mixin' with the blood, makin' it look like a chip-beef stew. In a minute the Boss riz up, still groanin' an' says he, "You blamed little Fool you; ain't you got a bit o' Sence!" An' I backed away, for I thought sure he was a-goin' to Hit me, an' after I was behind the sofa, says I, "You told me to do it, an' now you find fault with me 'cause I done it. An' it wasn't only yesterday you told me, says you, 'James, when I tell you to do a thing don't you ast no questions, you jis' go on an' do it, leavin' the consequences to me.'"

An' then he seen he couldn't say nothin' more, so he went out to git some brown paper an' Vinegar to put on his Head. The las' thing says he, "Telephone to the *Daily Globe* offis, James, right away, an' tell them not to put that what's in to-day's paper in the Blue Book. Tell them to leave me out entirely. If they raise any Objection you tell 'em I'll sue them for Damages if they don't do like I say." So I telephoned, an' they said they didn't Know nothin' about no Blue Book, an' I told them about how all that was in the paper that mornin' was to go in the Blue Book, an' the Editor said I be Dam, nobody there in the Offis didn't know what I was a-talkin' about. So then I ast for Mr. Manson himself, an' they said they didn't know where he was, any more, probably in Californy, 'cause he hadn't had nothin' to do with the *Globe* this two year or more. So I told the Boss an' he groaned harder than ever, an' he never said a word, but he went to Bed, right away, an' it wasn't only eight o'clock in the Mornin'.

Cincinnati, O.

FRANK W. SAGE.

The Dental Digest.

PUBLISHED THE FIFTEENTH DAY OF EVERY MONTH

At 2231 Prairie Avenue, Chicago,

Where All Communications Should be Addressed.

Editorial.

DECISION OF JUDGE TOWNSEND IN THE KYLE CASE.

Last month we stated that just as the *DIGEST* was going to press a telegram was received from the Protective Association's local attorney in New York City, to the effect that Judge Townsend had set aside his former decision in the Kyle case on the ground of collusion. We give the decision in full herewith:

INTERNATIONAL TOOTH CROWN CO.,	}	UNITED STATES CIRCUIT COURT, SOUTHERN DISTRICT OF NEW YORK.
vs. JAMES ORR KYLE.		
TOWNSEND, J.		

This cause having been heard upon the petition of Allen G. Bennett, et al. to vacate and annul the decree heretofore entered herein, and upon affidavits and arguments of counsel in behalf of the said petitioners and the said complainant, International Tooth Crown Company, and it appearing to the Court that the proceedings therein were procured by collusion between the complainant, International Tooth Crown Company, and the defendant, James Orr Kyle, and that there was no real controversy between them, it is hereby *ordered, adjudged and decreed* that the said decree, to wit, the decree entered on or about the first day of January, 1900, be and the same is hereby vacated and annulled, and that this cause be dismissed.

It is further ordered that said International Tooth Crown Company pay the disbursements incurred in the said application for vacation of said decree.

WM. K. TOWNSEND, Judge.

As stated last month, the members of the Association may well congratulate themselves on this decision, for the fight can now be carried on with no unjust odds against us. Again, it will be remembered that in October last a decision was given against a member of the Protective Association on the Low bridge patent by a jury in Judge Lacombe's court. The Association has carried the matter up to the Court of Appeals, and Judge Lacombe has ruled that he will hear no more cases until that court has passed upon this one. He has further ruled that no dentist need show his books in court. Matters are therefore at a standstill in that Federal district, and will

be until the Court of Appeals renders its decision. We have every reason to believe that said decision will be favorable to the Association. As new developments arise we will keep our readers posted.

CONCERNING CHANGE OF DATE OF NATIONAL MEETING.

An effort is being made to change the date of meeting of the National Dental Association, so that those who wish to attend the meeting of the International Dental Federation at Stockholm, Sweden, in August, can do so without missing the National. An investigation of the subject, however, shows that the officers and members of the National, almost without exception, are decidedly opposed to such change, and that only a very few of those who ordinarily attend the National meeting wish or expect to go to Europe. Furthermore, a contract has been signed and the money paid, so that a fine convention hall and series of committee rooms may be had for the National, and the Association is bound by this contract. In view of all these facts it is extremely unlikely that there will be any change.

A canvass is now being made of the members of the Faculties' Association, to ascertain how many desire to attend the Stockholm meeting, and if it is found that any considerable number expect to take the trip an effort will be made to change the date of the Faculties' Association meeting, which is scheduled to meet just previous to the National. We have always maintained, and results have shown, that by having the National Dental Association, the National Association of Dental Faculties, and the National Association of Dental Examiners, meet at the same time and place, all three organizations are benefitted and strengthened. We therefore believe it would be detrimental to all three if the Faculties' Association should now meet at a different time and place from the other two bodies, and the members of the N. A. D. F. will probably hold the same belief.

Notices.

NORTHERN INDIANA AND SOUTHWESTERN MICHIGAN SOCIETIES.

At the meeting of the Northern Indiana and Southwestern Michigan Dental Societies, held at Goshen, Ind., September, 1901, the following officers

were elected for the ensuing year—Northern Indiana Society: Pres., F. G. Conklin; V.-P., F. M. Burkett; Sec'y and Treas., M. A. Payne. Southwestern Michigan Society: Pres., C. R. Rowley; V.-P., R. M. Speer; Sec'y and Treas., C. W. Johnson. The next meeting will be held at South Bend, Ind., September, 1902.

TEXAS STATE DENTAL ASSOCIATION.

The annual meeting of the Texas State Dental Association will be held at Waco, May 13-15, 1902. The executive committee promises a fine program and the meeting is expected to be the largest in the history of the Association.

BUSH JONES, Sec'y and Treas., Dallas.

SOUTHERN DENTAL SOCIETY OF NEW JERSEY.

At the third annual meeting and banquet of this society, held at Camden, Jan. 15, 1902, the following officers were elected for the ensuing year: Pres., C. P. Tuttle; V.-P., J. G. Halsey; Rec. Sec'y, J. F. Smith; Cor. Sec'y, T. V. Smith; Treas., M. A. Morrison; Ex. Com., A. Irwin, J. E. Duffield, A. B. DeWees, W. A. Jaquette, W. W. Crate, O. E. Peck.

SEVENTH DISTRICT DENTAL SOCIETY OF NEW YORK STATE.

The thirty-fourth annual meeting of the Seventh District Dental Society of the State of New York, will be held at the Osborne House, Rochester, April 8-9, 1902. A number of valuable papers will be read and a great many clinics given. All members of the profession are cordially invited to attend.

F. MESSERSCHMITT, Chairman, 138 Main St., Rochester.

MISSOURI STATE DENTAL ASSOCIATION.

The thirty-eighth annual meeting of the Missouri State Dental Association will be held at Jefferson City, May 21-23, 1902. Business meetings will be held in the legislative hall of the statehouse and the clinics will be held in the state penitentiary, thus insuring an abundance of clinical material. The papers to be read before the Association are of a most interesting character, and the meeting bids fair to be one of the best ever held in the state. It is certainly to be hoped that with the change in time of holding the meeting, and many other attractive features, the attendance will be all that can be desired.

J. H. KENNERLY, Sec'y, St. Louis.

NEW JERSEY STATE DENTAL SOCIETY.

The committee on exhibits desires to announce that at the thirty-second annual meeting of the Society, to be held as usual in the Auditorium, Asbury Park, July 16-18, 1902, the large room which is especially adapted for exhibition purposes will be devoted exclusively to the exhibits, and every advantage and convenience is here offered for a great display. A special inducement to all exhibitors is the fact that at last year's meeting over five hundred dentists registered at the entrance to exhibit hall. This will be a

"big year" from the exhibit standpoint, as many exhibitors have already written to secure the space generally selected by them. The names of those who do so before the program goes to press will be mentioned therein, together with the nature of their display. It is earnestly requested that those desiring space communicate with chairman at an early date.

F. L. HINDLE, Chairman, New Brunswick, N. J.

ILLINOIS STATE DENTAL SOCIETY—COMMITTEE ON ART AND INVENTION.

The committee on Art and Invention of the Illinois State Dental Society hereby invites and solicits a contribution of anything new in the way of appliances and inventions designed during the past year, which will be of interest to the profession in general. Everything submitted should be sent direct to the undersigned, with detailed description of its use and application, by April 1, in order that it may receive proper classification and consideration in the presentation of the annual report at the coming meeting at Springfield, May 18-16. The committee will care for and return each article submitted, but reserve the right to reject any which in their opinion may not be of practical value.

HART J. GOSLEE, Chairman, 580 Madison St., Chicago.

MASSACHUSETTS DENTAL EXAMINING BOARD.

The meeting of the Massachusetts Board of Registration in Dentistry for the examination of candidates will be held in Boston, March 5-7, 1902. Candidates who have applied for examination will report to the secretary, Wednesday, March 5, at 9:30 a. m., at Tufts College Dental Infirmary, corner Huntington and Rogers avenues, and come prepared with rubber-dam, gold and instruments, to demonstrate their skill in operative dentistry. Any one who wishes may bring his patient. So far as possible patients will be furnished. The Board in every instance selects the cavity to be filled. Partially prepared cavities never accepted. The theoretic examination—written—will include operative dentistry, prosthetic dentistry, crown and bridge work, orthodontia, anatomy, histology, surgery, pathology, materia medica, therapeutics, physiology, bacteriology, anesthesia, chemistry and metalurgy, and will be held at Civil Service Rooms, State House, from Thursday, March 6, at 9:30 a. m., until Friday p. m., March 7.

All applications, together with the fee of twenty dollars, must be filed with the Secretary of the Board on or before Feb. 26, as no application for this meeting will be received after that date. Every candidate for examination must be twenty-one years of age. Application blanks may be obtained from the Secretary. Candidates who have taken an examination and failed, and desire to come before the Board again at this meeting, are not required to fill out a second application blank, but must notify the Secretary as above in order to be examined. The fee for third and subsequent examinations is \$5.

G. E. MITCHELL, D.D.S., Sec'y, Haverhill.

News Summary.

"UNEASY rests the aching tooth that wears a crown."

EARL CARTER, a young dentist at Yates City, Ill., died Jan. 25, 1902.

W. S. MARTIN, a dentist at Loveland, O., died suddenly Jan. 17, 1902.

T. E. EDDY, 56 years old, a dentist at Cassville, Wis., died Jan. 26, 1902.

G. W. BAKER, 42 years old, a dentist at Harrisburg, Pa., died Jan. 26, 1902.

J. P. CRUTCHER, 77 years old, a dentist at Nashville, Tenn., died Feb. 7, 1902.

THE name of the *Ohio Dental Journal* has been changed to the *Dental Summary*.

FRANK FREYMAN, a dentist of Dyersville, Ia., died Jan. 12, 1902, from bronchitis.

RACY.—When a man starts for a dentist's office he usually strikes a tooth-hurty gait.

G. L. ROBB, 60 years old, a dentist at Huntingdon, Pa., died from paralysis Feb. 6, 1902.

A. DOUD, 60 years old, a dentist at Ft. Scott, Kan., died Feb. 7, 1902, of Bright's disease.

S. H. WHITMAN, a retired dentist of Newport, Pa., died suddenly of heart disease Feb. 1, 1902.

A. E. SHEETS, one of the oldest dentists in Newark, N. J., died from apoplexy, Jan. 29, 1902.

CARLOS E. WAITE, 61 years old, a dentist at Springville, N. Y., died of apoplexy, Jan. 21, 1902.

O. E. MICKEL, 40 years old, a dentist of Haverhill, Mass., died Jan. 13, 1902, of heart failure.

EXCLUSIVE.—"How exclusive that Brown girl is." "Yes, I don't believe her teeth move in the same set."

A. B. CLARK, for many years a dentist of Chicago, has left this city for Honolulu, where he has opened an office.

O. E. RORK, 52 years old, a dentist at Washington, Ia., died Jan. 18, 1902, from a complication of stomach and other troubles.

INDISPENSABLE.—"Please continue my subscription to the DIGEST. I cannot get along without it." E. J. Tucker, Roxboro, N. C.

J. B. LOUD, 45 years old, a dentist at Cincinnati, O., is dying in that city from consumption, and has to be fed through a rubber tube.

STRENUOUS LIFE.—Peaceful business methods oft succeed where others fail, yet dentists and chiropodists keep fighting tooth and nail.

A. WILKES SMITH, founder of the Louisville College of Dentistry, is critically ill at his home in Richmond, Ky., from neuralgia of the heart.

"DEVITALIZED" AIR.—A dentist advertises to use "devitalized" air. We suppose he makes it by applying arsenic to vitalized air.

EDGAR D. SWAIN, one of the pioneer dentists of Chicago, but for the past three years a resident of New York State, is in the city visiting old friends.

C. F. LEWIS, 46 years old, a dentist, formerly of Burlington, Vt., but for the last thirteen years of London, England, died Feb. 4, 1902, after a year's illness.

COMMENDABLE SUPERSTITION.—Certain Indian tribes of the northwest believe that medicine unless paid for will do no good. Such superstition should be encouraged.

H. B. BARBER, 88 years old, formerly of Naperville, Ill., died at Colorado Springs Feb. 5, 1902. He was a graduate of the Chicago College of Dental Surgery, Class of '89.

ROBERT SALTER, 65 years old, an early active and later honorary member of the Rochester Dental Society, died in that city Jan. 2, 1902, after an illness of several years.

BANKRUPT.—**L. F. Brine**, Boston. Liabilities \$599.97, assets nothing. **C. D. Calkins**, Waterloo, Ia. Liabilities \$180, assets nothing. They will be falling for 80 cents next.

GIVE HIM TIME.—A distinguished dentist was reading an interesting paper on pyorrhea, and one of the listeners asked his neighbor; "Didn't Dr. Blank write that?" "Not yet," was the reply.

WISCONSIN EXAMINING BOARD. The governor has appointed Dr. J. J. Wright of Milwaukee as a member of the Wisconsin State Board of Dental Examiners, to succeed Dr. W. H. Carson.

SACRAMENTO COUNTY (CAL.) DENTAL SOCIETY held its annual meeting Jan. 14, 1902, and elected the following officers: Pres., W. J. Taylor; V.-P., J. B. Simmons; Sec'y and Treas., H. H. Stephenson.

MARRIED.—**R. C. Bain**, St. Paul, Neb., Jan. 22; **Luther Hayes**, Bloomington, Ill., Jan. 29; **R. F. Jones**, Utica, N. Y., Jan. 15; **H. E. McClure**, Pittsburg, Feb. 2; **B. F. Redman**, Des Moines, Ia., Jan. 29.

REVIEW CHANGES EDITORS.—The editorship of the *Dental Review* has been transferred from Dr. A. W. Harlan to Dr. C. N. Johnson. Dr. Johnson was the former editor, and we welcome him back to the fold.

LOWELL (MASS.) DENTAL SOCIETY.—A society with this name was organized Jan. 29, 1902, and the following officers were elected: Pres., A. W. Burnham; Sec'y, E. E. Kinney; Treas., E. L. Farrington.

LYCOMING COUNTY (PA.) DENTAL SOCIETY held its annual meeting Jan. 28, 1902, and elected the following officers: Pres., N. R. Hubbard; V.-P., H. A. Krumrine; Sec'y, W. B. Reilly; Treas., A. V. Robbins.

GENTLE HINT.—"What do you think the weather will be to-morrow," asked a subscriber of the editor, and the latter replied, "I think it will be very much like your subscription." The subscriber happened to think of the word "unsettled," and remedied the difficulty at once.

"PRINCIPLES AND PRACTICE OF OPERATIVE DENTISTRY." By John Sayre Marshall, M.D. 685 pages, 722 illustrations. Cloth, \$5; Sheep, \$6, delivered. J. B. Lippincott Co., 1901. Philadelphia and London.

LORAIN COUNTY (O.) DENTAL ASSOCIATION held its annual meeting at Elyria, O., Jan. 14, 1902, and elected the following officers: Pres., B. E. Saunders; V.-P., E. F. Grover; Sec'y and Treas., B. A. Purcell.

MILWAUKEE ODONTOGRAPHIC SOCIETY held its first annual meeting Feb. 7, 1902, and elected the following officers: Pres., James T. Stuart; V.-P., F. H. Emmerling; Sec'y, G. B. Stewart; Treas., P. B. Wright.

SOUTH DAKOTA DENTAL LAW.—The dentists of South Dakota will test in the courts the constitutionality of the law passed by the last legislature, compelling dentists to pay an annual license fee of \$2 on July 1 of each year.

GRAND RAPIDS (MICH.) DENTAL SOCIETY held its annual meeting Feb. 11, 1902, and elected the following officers: Pres., J. Ward House; V.-P., H. D. DeWar; Sec'y, H. D. Watson. Ex. Com., L. F. Owen and W. A. Studley.

OHIO VALLEY DENTAL SOCIETY.—A society with this name was reorganized at Wheeling, W. Va., Jan. 23, 1902, and the following officers were elected: Pres., F. S. Maxwell, V.-P., H. H. Harrison; Sec'y, J. H. McClure; Treas., J. G. Parr.

SENECA COUNTY (O.) DENTAL SOCIETY.—A society with this name was organized at Tiffin, O., Jan. 15, 1902, and the following officers were elected: Pres., F. Gebert; V.-Ps., L. C. Cochrane, G. F. Eddy; Sec'y, F. E. McLaughlin; Treas., R. G. Boyland.

MONTANA DENTAL LAW.—The report of the Montana State Board of Dental Examiners states that at the last session of the legislature certain changes were made in the dental law of the state, which has placed it on an equal footing with those of other states.

"INTERNAL ANATOMY OF THE FACE." By M. H. Cryer, M.D., D.D.S. Regional anatomy of the face offered to students and dentists as a substitute for dissection; Over 150 photographic illustrations. Price, cloth, \$1.50 net. S. S. White Mfg. Co., Philadelphia, Publishers.

CHESTER AND DELAWARE COUNTY (PA.) DENTAL SOCIETY held its annual meeting at Media, Pa., Jan. 23, 1902, and elected the following officers: Pres., C. H. McCowan; V.-P., F. M. Smith; Treas., H. L. Smedley; Sec'y, J. H. Campbell. Ex. Com., S. B. Luckie, R. M. Scott, W. Kassab.

FLORIDA VS. HELL.—The icy winter weather suggested to the Sunday-school teacher that it was a good time to imprint a deep lesson on the minds of the children. "Now, Johnny," she said, "Tell me the name of the hot place where bad people go who steal money." "Florida," said Johnny.

GAS NEARLY CAUSES MURDER.—A muscular young man in Pennsylvania took gas last month, and when the first tooth was extracted he jumped from the chair and nearly killed the dentist before help arrived. When he came out from under the influence of the anesthetic he remembered nothing of the occurrence.

HARVARD ODONTOLOGICAL SOCIETY.—At the annual meeting and banquet of this organization Jan. 30 1902, the following officers were elected for the ensuing year: Pres., J. G. W. Werner; Rec. Sec'y, T. T. Estabrook; Cor. Sec'y A. H. Stoddard; Treas., A. S. Burnham. Editor, H. W. Haley.

MONEY DANGEROUS—WHEN DIRTY.—The Ohio State Board of Health at its recent annual session adopted a resolution condemning the continued use of paper money after it has become soiled from too much handling. It was shown that dirty paper currency is a prolific source of disease and a fertile carrier of bacteria.

EXTRACTION RESTORES SIGHT.—According to newspaper report, a woman at Houston, Tex., who has been totally blind in one eye for three years, has recovered the use of that organ through extraction of some decayed teeth. They were abscessed, and it was thought pressure was exerted by them on the optic nerve, paralyzing it.

NEW YORK COLLEGE OF DENTISTRY ALUMNI ASSOCIATION held its annual meeting Jan. 15, 1902, and elected the following officers: Pres., John I. Hart; 1st V.-P., Edward Fox; 2d V.-P., H. R. Armstrong; Sec'y, J. O. Taylor; Treas., F. A. Chicherio; Curator, F. J. McLaren. Ex. Com., W. C. Deane, Chairman, F. Fossum, B. C. Nash.

NORTH CAROLINA DENTAL LAW.—A bill to amend the dental law of North Carolina was introduced in the House Jan. 22. It strikes out of the law section three, which provides that all graduates of dental colleges which require a three years' course of study shall be entitled to certificates upon payment of the certificate fee and without examination.

RECOMMENDED TO DR. OTTOLENGUI.—"Dr. Ludlow, a new dentist who is located in Grimsby, claims to be able to fully restore the features to the appearance possessed previous to the loss of any teeth. This restoration of the features is patented, and Dr. Ludlow is the only dentist in Canada who has a right to practice it."—*Grimsby (Ont.) Independent*.

MIXED TREATMENT.—Mr. Kelly—"An' how are ye this mornin', Mistress Flynn? Is your rheumatiz any better?" Mrs. Flynn—"Well, yis, I think it is, I thank ye kindly. The new doctor's treatment is doin' me a worl' av good, I belave. He advises me to take queen ann eternally, and to rub anarchy on me j'int's. So I'm doin' it, an' I think it's helpin' me wonderful."

DIRT-EATERS.—The newest and craziest fad is dirt-eating, and it originates in St. Louis. The devotees take a spoonful of dirt each day, and the leader of the cult is making a very good living by distributing sand among his followers at 25 cts. per small sack. This is probably on the same principle that a rooster eats gravel, an ostrich cobble-stones, and a billy-goat tin cans.

POWERFUL—An old colored woman threw all the odds and ends of medicine left after her husband's death into the fire. There was a sudden explosion which upset everything in the house, threw the old lady and the stove out of the window and smashed the roof. When she had sufficiently recovered she exclaimed: "Mos' pow'ful movin' medicin' Ah evah sawd. No wondah the ol' man died."

"ANATOMY DESCRIPTIVE AND SURGICAL." By Henry Gray, F. R. S., Lecturer on Anatomy at St. George's Hospital, London. Thoroughly revised American from the 15th English Edition. In one imperial octavo volume of 1246 pages, with 780 illustrations. Price, with illustrations in black, cloth, \$5.50 net. Price, with illustrations in colors, cloth, \$6.95 net; leather, \$7.35 net. Lea Bros. & Co., Philadelphia, Publishers.

MARRIED DENTISTS UNRELIABLE.—A correspondent relates that two women entered his office recently and asked him if he was married. Upon his saying that he was not, one of them made an appointment to have some work done. She explained that the two or three dentist's wives whom she knew always told her confidentially what women wore false teeth, and she did not care to be a walking advertisement for any dentist.

BEANS CAUSE DEATH.—A widow in Philadelphia is suing an accident insurance company for \$5,000, same being the amount of an accident policy which her husband had held. He had typhoid fever and nearly died; then when he began to get well he wanted some baked beans, of which he ate a great quantity. The post-mortem examination showed that the beans had perforated his intestines, causing death, and the widow holds that this was an accident. This is the limit.

MUNIFICENT.—On one of the coldest nights this winter a dentist in a small town was routed out at 2 a. m. by a physician to extract a tooth for a patient who had driven in from the country. The physician had first made an attempt and broken the tooth off. With only a kerosene lamp to see by ether was administered, and after several hours work the roots were removed. When the patient recovered he could produce only 50 cents. We have not heard what the professional gentleman produced—probably a club.

"ECKLEY'S ANATOMY OF THE HEAD AND NECK."—Regional Anatomy of the Head and Neck. A text-book for Students and Practitioners of Dentistry. By William T. Eckley, M.D., Professor of Anatomy in the Chicago College of Physicians and Surgeons, etc., etc., and Corinne B. Eckley, M.D., Professor of Anatomy, Chicago School of Anatomy and Physiology, etc., etc. In one octavo volume of 240 pages, with 86 engravings and 20 full-page colored plates. Cloth, \$2.50 net. Lea Brothers & Co., Publishers, Philadelphia and New York.

"HOIST BY HIS OWN PETARD."—A young dentist in New England recently tried a sharp advertising scheme. He sent bills and letters to the best people in the city, the latter expressing the hope that their teeth had been in good condition since the last visit, and suggesting that perhaps the patients would better call for a final examination before paying the bill. The object of course was simply to get good people to his office. Soon after a man about twice as big as the dentist called and acknowledged receipt of the letter and bill, the latter being for \$15. He stated that all the work which the dentist had done for him was unsatisfactory and that it must be made right at once. The dentist had never seen the man before, of course, but thought discretion was the better part of valor and so gave up the day to

putting in order the worst looking mouth which it had ever been his misfortune to see. After the dentist had used up several hours of time and several dollars worth of gold and other material the man paid the aforesaid bill of \$15. The young dentist now is strictly ethical and does not believe in advertising.

CHLOROFORM FOR CHILDREN.—Mr. A. E. Francis read a report, published in the *Brit. Jour. Den. Sc.* of a case in which the administration of nitrous oxid to a girl ten years of age gave rise to 'slow, shallow respiration, great lividity, and enormous venous distention—the heart on auscultation and percussion being found to be distinctly distended and a systolic murmur being heard over the displaced apex. The recovery was good, and on a subsequent occasion when chloroform was used no trouble followed.' This is another case in support of the opinion that chloroform is well tolerated by children.

PECULIAR ACCIDENT.—This month a physician in Pennsylvania took his false teeth out of his pocket and put them in his mouth just before starting out to see a patient. He soon after became delirious, and the attending physician detected symptoms of atropia poisoning, which passed away under proper treatment. After recovery the patient stated that he had a queer taste in his mouth soon after inserting the plate, and he believed that a tablet in his pocket containing atropia adhered to the plate and dissolved in the mouth. Any man who carries his false teeth around in his pocket deserves what this one got.

WELDING COPPER.—Professor J. R. McCall, in the *Record* of the University of Tennessee, gives the following directions for welding copper: The copper should be treated with potassium nitrate and a cyanid, after which it is welded to itself, or to iron or steel, in the same way that iron is welded in the ordinary forge shop. A clean fire of coke or charcoal and a temperature of the copper considerably below a white heat insure the best results. A temperature above this makes the metal brittle in working, while one much below will not give sufficient fluidity to the flux. In tension tests the welded joints developed practically the whole strength of the copper.

PATHOGENESIS OF RANULA.—L. Imbert and E. Jeanbrau describe the cysts with ciliated epithelium which are situated on the floor of the mouth and called ranula. The ordinary form is not characterized by its pathogenesis, which is as yet undetermined, nor by its symptomatology nor etiology, but by its histological structure. The various theories in regard to the formation of ranula, such as degeneration of the sublingual glands and salivary retention, seem unsatisfactory to the authors, who have been led to believe in a congenital origin—some defect in development as yet not understood, but perhaps connected with the history of the branchial.—*Med. Record.*

HUNTERS PLEASE NOTE.—A dentist in California writes to the *Dominion Journal* as follows about the close seasons: "1. Those who accept a dental journal three years and then refuse to pay for it 'because it was not ordered' may be killed in any month of the year, preferably January. 2. The man who tells fish stories about his inability to learn anything new at the meetings of his dental societies may be caught with a net in any month, provid-

ing the mesh is large enough to admit his head only. A small herring net is mostly used. 8. The man who joins said dental society, and never attends nor pays his fees, may be shot between October 1 and July 1, both dates inclusive. 4. The man who stands in front of a patient and sniffs at another fellow's root fillings may be trapped and shot from Jan. 2 to Dec. 31 inclusive.

APPENDIX NOT A RUDIMENT.—The opinion has recently been enunciated by a German writer that the appendix is not, as has been supposed, a vestige of some important organ that has served its purpose, but that it is a lymphoid organ analogous to the tonsil. The fact is, as comparative anatomy shows, as we ascend in the animal scale this organ tends to differentiate from the cæcum and to accumulate lymphatic elements. The appendix therefore possesses for man a significance the reverse of that commonly conceded to it. Instead of being a token of atavistic degeneration it is a sign of nobility and of animal aristocracy.—*Med. Age*.

POTASSIUM PERMANGANATE AN ANTIDOTE FOR OPIUM.—Graham Chambers of Toronto, in experiments with potassium permanganate as an antidote to morphin, arrived at the following conclusions: (1) Potassium permanganate in dilute solution, not stronger than one grain to one ounce, may be given by the stomach without danger; (2) subcutaneously it is a poison; (3) grain for grain, it completely decomposes morphin. We find many reports from competent practitioners all over the world detailing the brilliant and even marvelous results from the administration of this most useful drug in all forms of opium poisoning. It seems to act best when given hypodermically, from one-half to two grains at each injection.—*T. H. Marable, Med. Age*.

PHYSICIANS IN THE U. S.—According to the Standard Directory, the total number of physicians in the United States is 115,222. Excluding the colonies this gives an average of one to about 650 people. The states having the greatest number of physicians in proportion to population are as follows: California one to 421; Colorado, one to 488; Vermont, one to 494; Indiana, one to 531. Closely following these are Massachusetts, Ohio and Tennessee. Illinois has one to 612; Iowa, one to 651; North Dakota, one to 1380; North Carolina, one to 1885; New Mexico, one to 1970; Wisconsin, one to 909; Minnesota, one to 898. In cities, Washington, D. C., has one physician to 210 people; Chicago, one to 446; Philadelphia, one to 500; New York, one to 545; Boston, one to 388; St. Louis, one to 471; Buffalo, one to 645 and Milwaukee, one to 806.

BIFID TONGUE.—By H. H. Bywater, M.B.Vict., Preston. The patient, a corporation laborer, aged 35, came to the Preston Royal Infirmary suffering from burns to the face. On asking him to put out his tongue I noticed that it was separated into two parts by a central depression extending backwards for quarter of an inch from the tip. From this depression a median groove (which was deeper near the bifid tip) extended backwards on the dorsum of the tongue and also beneath it. The tongue was of normal size and healthy in appearance. The frenum linguæ was normal. The patient has had this deformity all his life. This congenital malformation is very rare. I have only found mention of one previous case—that communicated by Brothers

to the New York Pathological Society, and quoted by Holt in his book on "Diseases of Children." Gould and Pyle ("Anomalies and Curiosities of Medicine," page 255), refer to cases of supernumerary tongue, and quote that of the Rev. Henry Wharton, who in his journal, written in the seventeenth century, says that he was born with two tongues and so passed through life, one, however, gradually atrophying.—*British Med. Jour.*

BLEEDING AND TENDER GUMS.—

R. Gelatin, 80 grains.
Sodium chlorid, 8 grains.
Carbolic acid, 2 grains.
Beta-eucain hydrochlorat \acute{e} , 8 grains.
Cocain hydrochlorate, 2 grains.
Distilled water, 8 $\frac{1}{4}$ ounces.

Use as a mouth-wash.—*Merck's Archives.*

HUNGER.—A German physician says we feel hungry when the blood vessels of the stomach are comparatively empty. Many anemic patients have no appetite even when the stomach is empty; but the blood vessels of the stomach are not empty in such cases but rather congested. In healthy people lack of blood in the stomach acts upon a special nerve and all the characteristic symptoms of hunger follow. Now this hunger nerve, and the nerves of the mouth and tongue, are branches of the same nerve trunk. Hence a stimulus applied to the tongue, by a spice for example, creates or increases appetite. On the other hand, when the nerves of the tongue are affected by a diseased condition of the mucous membrane of the mouth, the patient has no appetite, though his stomach may be empty and he may be in actual want of food.—*Modern Medical Science.*

NARCOSIS OF SCHNEIDERLIN.—Korff has modified the method of Schneiderlin of producing anesthesia by injections of scopalamin and morphin, using the injection at intervals of two hours for a short time before the operation (.0004 scopalamin and .01 morphin). Then during the operation a very small quantity of chloroform, perhaps not more than a third as much as that usually employed, is administered. The advantages are that the patients never suffer any anxiety, never vomit; can be awakened at almost any time during the operation without feeling any pain, and when they recover from the anesthesia have no nausea, and can usually take Vichy water followed by soup or coffee at once. The following night they usually sleep poorly, but are not restless, and the next day everything is normal. He has operated upon eighty cases by this method, and in seven of these no chloroform was necessary. Much smaller doses should be used for children.—*Muench. Med. Woch.*

CAME EASY, BUT PRICE WAS HIGH.—My brother read a paper upon dental hygiene before the medical society which met in Augusta last month. I wish to give you an illustration from his observations which will well illustrate the point I desire to make by this paper. In his county there was published and widely distributed a book upon "Tocology, or child-birth made easy." The book called for a diet composed of non-bone and non-teeth

elements for pregnant women; this made the bones soft and yielding, also childbirth easy. He observed twenty-two cases of children born under this process, all of them under two years old, and not in a single case did the child have any whole teeth. Those that did have teeth were suffering untold agony because the teeth had broken off at the gum line; great quantities of pus came from around the teeth. All this evil was traced to the same cause. The mothers had been fed upon sweetmeats and delicacies containing starch, sugar and fine bolted flour; in short, the mothers were deprived of every single article that contained bone building material.—Dr. R. B. Adair, *Dental World*.

GUM CHEWING; ITS EFFECT ON THE TEETH.—A. Lenhardtson publishes in the *Med. Woche* a note upon the teeth of the inhabitants of the province of Dalecarlia in Sweden. He observed that 24.7 per cent of the boys and 28 per cent of the girls in the province of Goedermanland had caries of the permanent teeth, and that 38.5 per cent of the boys and 84.2 per cent of the girls had caries of the milk teeth; whereas in the province of Dalecarlia 15.6 per cent of the boys and 16.2 per cent of the girls had caries of the permanent teeth, and 84.4 per cent of the boys and 49.1 per cent of the girls had caries of the milk teeth. It will be noted that there was but little difference in the proportion of caries in the milk teeth of the children of both provinces. But in the permanent teeth the proportion of caries was very much lower in Dalecarlia than in Goedermanland. This comparative freedom from caries is attributed by the author to the practice of chewing burgundy pitch, which is universal in the province of Dalecarlia. The author furthermore attributes the beneficent action of the gum, not purely to its mechanical effect, but to the oils contained in it, which are of an antiseptic and bactericidal character.—*N. Y. Med. Jour.*

PHYSICIAN'S FEES.—A very important ruling was made by Judge Armstrong at Camden, N. J., on August 2d. Dr. Godfrey, who had attended a woman for four years, put in his claim as a preferred creditor for \$349 against her estate, after her decease. It appears that the patient had been suffering from Bright's disease, and while under Dr. Godfrey's care had been recommended by him to go to Bedford Springs, where she died. While she was there another physician attended her. The claim was made by the defendant estate that not Dr. Godfrey, but this other physician, who was called in at the last, attended the patient in her last illness, and that therefore Dr. Godfrey had no *locus standi* as a preferred creditor. In this point of view the court very properly, as it seems to us, declined to concur, but ruled, on the contrary, that Dr. Godfrey did attend the woman in her last illness. It seems to us to be clear that as the attendance was continuous over the period of the illness which ended fatally, until the patient, at Dr. Godfrey's advice, went to Bedford Springs, her being there was in fact part of the treatment prescribed by him, and unless it could be shown that the patient had actually dismissed him after going there, it must reasonably be assumed that she continued to carry out his treatment in general, notwithstanding the presence of another physician, whose attendance should be regarded in the light of

auxiliary aid in an emergency, much as would be the case were the nearest physician summoned, say, in an attack of hemoptysis, when the doctor under whose continued care a tuberculous patient was did not happen to be at home. Surely both physicians in such a case would be properly held to have been in attendance during the last illness.—*N. Y. Med. Jour.*

MALIGNANT DISEASE OF THE TONSIL.—F. E. Hopkins says that the diagnosis between carcinoma and sarcoma in these cases is not always easy. Males are more subject to cancer than females. Epithelioma quickly ulcerates; sarcoma more frequently forms a rounded, smooth, distinct tumor, ulceration occurring later, and beginning at a point which comes in contact with some other surface, as, for example, the base of the tongue. It is stated that carcinoma tends to invade tissues forward, while sarcoma extends backward. The best hope for successful operation lies in early and complete removal. In early sarcoma operation may be performed through the mouth. To shell out the growth with the finger, or blunt dissection, would seem to offer better promise of thorough removal than the use of the knife or the cautery. Any enlarged lymphatic gland should certainly be removed. At a later stage the external operation is to be performed. Coley treated a case of sarcoma of the tonsils with injections of the toxins of erysipelas. The patient died of recurrence, but after an interval of eight years. Massey has reported cures by the cataphoric destruction of cancer cells. Hubbard successfully treated a case of epithelioma of the soft palate by injections of liquid potassae.—*Boston Med. and Surg. Jour.*

ETIOLOGY OF PHOSPHOR-NECROSIS.—Prof. Ralph Stockman contributes to the *Brit. Jour. Den. Sc.* an extended article on phosphor-necrosis, dealing, especially with the etiology of this disease. He believes that the cario-necrosis of the jaw is not due to a specific action of phosphorus fumes, but to a microbic infection. He draws this conclusion from his studies of individual cases, having analyzed the pus from six. He believes that the bacillus tuberculosis is the active cause of the disease, and he supports this opinion by several weighty arguments. A proof of the tuberculous nature of the jaw disease, he says, is to be found by looking through the accounts of post-mortem examinations of fatal cases. In most cases death occurs from tuberculosis of the lungs. Whether this is due to infection from the jaw tubercle, or whether the phosphorus fumes damage the lungs and make them more susceptible to direct infection, I am unable to say. General tuberculosis is also not uncommon, while tubercle of the abdominal glands, and tuberculous ulcers from infection by swallowing the pus, abscess in the brain, purulent pleurisy, and tuberculous meningitis, are all occasional causes of death. Hætic fever and emaciation always accompany fatal cases. The part which the phosphorus plays is not far to seek. The acid fumes (phosphorus and phosphoric acids) produced by its oxidation in the air have no effect on bone covered by gum or mucous membrane; but when they can penetrate to the bone directly through the aperture left by a decayed or extracted tooth or any injury, they erode the bone, weaken its nutrition and resisting power at this small spot, and make it susceptible to infection by tubercle bacilli.

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Original Contributions.

IS DECALCIFIED NECESSARILY DEVITALIZED DENTIN ?

BY J. REQUA, D.D.S., ROCHESTER, N. Y. READ BEFORE THE ROCHESTER DENTAL SOCIETY, MAY 14, 1901.

In considering this question I do not expect to offer anything new in histology or on the pathological conditions of dentin, but as there is a difference of opinion and of practice among dentists as to leaving decalcified dentin in deep-seated cavities as a protection to the pulp, we will try and get at some facts in relation to the structure of that material, from the researches of those who are considered good authorities, and that have a bearing upon the subject.

In past years many widely different and diversified methods of treatment have been followed for the capping and protection of nearly or fully exposed pulps; the larger number of which were mostly empiric or experimental, and they have, after some show of success and more of failure, passed into disuse.

Some time previous to last year's meeting of the New York State Dental Society, the committee on practice submitted to many prominent dentists several questions, one of which was, "Do you leave decalcified dentin in cavities as a protection to the pulp?" You undoubtedly either heard or have read the report of that committee. However, I wish to recall a part of it to your attention. Those in favor of leaving such dentin were in a large majority, being about 43 as against 12. Dr. J. F. Flagg said, "Most decidedly; the more the better. I adopted this practice at Prof. Robert Arthur's suggestion more than forty years ago, and have never had other than increasing respect for it and increased confidence in it." Dr. S. B. Palmer finds a natural pulp-cap, sterilized, dried and filled with varnish, better than an artificial one. Dr. Palmer evidently considers it dead and past redemption, for he dries and fills it with varnish. Dr. Miller of Berlin answers, "Yes, occasionally; but it must not be partially decomposed or even wholly decalcified. It

must be sterilized and slightly impregnated with a poorly soluble antiseptic, such as thymol." Although Dr. Miller's answer is affirmative, it must be classified with the negatives, as he acknowledges the dentin must not be wholly decalcified, and that condition was not in the text of the question.

Continuing, the committee say, "Our views on the subject are clearly expressed by Dr. Joseph Head, as follows—'I do most unreservedly desire to say that I leave decalcified dentin in cavities where the pulp would otherwise be exposed, and find that such dentin treated with antiseptics not only tends to conserve the life of the pulp, but also tends to take upon itself lime salts that cause softening tissue to harden.' " Among those who do not believe in the practice are Drs. J. I. Hart, S. L. Goldsmith and R. R. Andrews, and those especially who make no exceptions are Drs. Harris, Wedelstaedt and Ottolengui; the latter going so far as to say, "I prefer to expose the pulp if necessary and fill the roots."

Dr. H. Prinz says, "Such dentin has evidently not lost its entire vitality, it is often hypersensitive. A thin layer of such dentin, if left over the pulp and impregnated with some strong antiseptic, will not cause recurrence of decay. It may even be, as seems to be verified by clinical demonstration, that the once softening dentin will reconstruct itself." In the foregoing we see the expectations of many, that decalcified or softened dentin will take upon itself lime salts and harden or reconstruct itself.

A few words upon this point—Dr. G. V. Black, at Buffalo last fall, in an able paper entitled "The Value of Exact Methods in Operative Dentistry," said, "The histology of the teeth was first made out by Tomes, beginning in 1835 and ending in 1860. He made out the structure of dentin, of the enamel, of the pulp, of the odontoblasts and of the dentinal tubes, and his descriptions still stand as correct. The application of the discoveries of Tomes has been very slowly coming about, until to-day we are in a position to use this knowledge as a basis for operating as we have never been able to use it before." I make this quotation for the purpose of emphasizing the following:

Tomes, in his *System of Dentistry*, published in 1859, page 20, says, "In dentin, which forms the great bulk of each tooth, we have no such thing as outward growth; no addition to the external surface of the formed tissue ever takes place."

Sudduth, in *American System of Dentistry*, page 592, says, "Dentin is a secretion of lime salts under the superintendency of the odontoblasts—not around themselves, but around their fibrils. The thickening of the dentin is by accretion of lime salts in such a manner as to lengthen the tubuli. The fibrils lengthen as the dentin thickens, and the odontoblasts recede before the forming dentin. The thickening of the dentinal wall is accomplished by a single layer of odontoblasts which begin the process, and these cells persist throughout the life of the pulp; when stimulated by the irritation of invading decay they have the power to throw out a secondary layer of dentin, which acts as a barrier against the enemy. This thickening is at the expense of the cavity of the pulp, and consequently of that of the size of the organ itself."

Black, *American System of Dentistry*, page 865, says, "Secondary dentin is the result of a new growth, excited by some abnormal condition of or injury to the tooth. It is always deposited upon the walls of the pulp-chamber, and results in the reduction of its size."

If the foregoing be admitted as true, and to-day it cannot be controverted, there can be no such thing as a deposition of lime salts beyond the containing walls of the pulp, either in the formation of normal dentin or of nature's protective substitute, secondary dentin.

Wherein consists the vitality of dentin? Certainly not in the basic principle of lime within its network of gelatin with no circulation and as passive as a piece of marble; but wholly in the persistent vitality of the contents of the tubuli which are destroyed in the process of decalcification, whether that process be considered as purely chemical or as brought about by the invasion of microorganisms or both.

In the formation of dentin nature seems to have recognized the requirement of a substance so dense as to be just beyond the possibility of circulation of blood and of repair, and I have only to add—decalcified is devitalized dentin.

Discussion. *Dr. J. H. Beebe*: I should say, No! in answer to the title of this paper. We all have seen the writhings of patients when the white, leathery substance we call decalcified dentin was removed. If any of us have ever applied a little chlorid of zinc on the surface of such dentin we know enough not to try it again. Even nitrate of silver sometimes causes pain in these cases. If

this decalcified dentin is dead I would ask what makes it so sensitive.

Dr. F. M. Rood: I leave the decalcified dentin in the tooth and cover it with a piece of tin foil and gutta-percha; then pack amalgam over it.

Dr. B. S. Hert: I have always thought that there was feeling in decalcified dentin, as it is not devitalized in many cases. I never leave decayed structure in the teeth, but remove all decay and even the pulp if necessary. When beginning practice I sometimes allowed decayed dentin to remain, but my experience with that method was unfortunate.

Dr. F. L. Sibley: As I understand it, there are only two bones in the body that will reproduce themselves, and this is a specialized bone and cannot do so. It is composed of a certain amount of organic matter. After it is made aseptic I remove certain portions of the devitalized dentin, especially in young teeth.

Dr. F. Messerschmitt: I never destroy the pulp if it can be helped, but usually remove all the leathery structure. The pain is caused by pressure, as the dentin is soft and impinges on the pulp under pressure. Some teeth with large cavities are never sensitive until the excavation comes near the pulp, and if that leathery substance is simply scaled away there is not much pain. I have had good success with Scheuer's paste. It is very sticky and hard to manipulate, so I place a bit of varnish in the cavity near the pulp; then moisten a fine instrument with glycerin, put a small quantity of paste up against the varnish, and drag paste over pulp carefully. When a good coating of that is secured cement can be put on at once.

Dr. Frank French: Formerly the idea was conveyed that a secondary deposit of dentin could be induced. I recall one case of a first molar in the mouth of a man thirty-five years old. In excavating more of the leathery substance was removed than I had intended, and the pulp chamber was exposed. I dried it as carefully as possible, saturated the whole cavity with hot air, and applied oxyphosphate of zinc. After this was hard the tooth was filled with gutta-percha. Some eighteen months later I took the gutta-percha out and found under the little cap of cement a secondary deposit of dentin, closing up the pulp-chamber. I filled the tooth, and it is to-day alive and doing good service.

Dr. H. S. Miller: I am heartily in favor of leaving a coating

of organic matter under certain conditions. It seems to me a great deal depends on the length of exposure, and probably more failures arise from the fact that the pulp itself has become diseased. Where the pulp is alive and healthy, however, it should be left. I do not believe that the decalcified dentin is dead.

Dr. Requa, closing discussion: Discussion ran largely on what cap should be applied, which was not the subject of the paper. I neither advocated nor opposed the idea that such dentin could never be reconstructed or hardened. Even in decalcified dentin it might be, as the tubes could be left and not be wholly decalcified. Even if they are in a perfect state of health, lime salts cannot travel up over them, and I tried to show that they never went beyond the containing walls of the pulp. I also tried to show that no lime salts passed beyond the walls of the pulp in the formation of dentin, and recalcification or reconstruction is a myth. Decalcified dentin is sensitive because vibration or pressure is communicated through it to structure which is sensitive.

FIRST MOLAR NECESSARY TO DENTISTS' FINANCIAL SUCCESS.

BY C. M. WRIGHT, D.D.S., CINCINNATI.

Twenty years ago a dentist of fine address and education, of refined tastes, cultivated by study and travel, with a large practice among the creme de la creme of the city in which he was located, accompanied me to a dental society meeting, the first he had ever attended. The subject under consideration was, "Shall the Sixth Year Molar be Preserved"? Shortly before that time Dr. Atkinson had suggested, that if for any cause early in a child's life one of these molars had to be sacrificed, it might be well, in order to preserve harmonious facial development, to extract the remaining three teeth. The question was warmly discussed pro and con, and purely from scientific, surgical and esthetic standpoints. After the meeting, as my friend and I were discussing the menu at the hotel, I asked him if he had not found the meeting interesting and profitable. His reply gave food for thought as a broad business view. Said he, "I was disgusted with the whole affair. I never listened to such stuff. Figure it out for yourself. The sixth year molars are particularly liable to decay, and each one may develop five or more cavities on the different surfaces. Let us say

five, then we may expect to be called upon to insert four times five fillings in each patient's sixth year molars. Each filling, we may say, will be worth \$4. Four times twenty equals \$80 for each patient's four first molars. Supposing a dentist has but one hundred patients each year who require these operations; one hundred times \$80 equals \$8,000. Supposing that there are 20,000 dentists in the world who have each these one hundred patients a year; multiply \$8,000 by 20,000 equals \$160,000,000, and you have that amount lost to the dental profession each year by the extraction of these sixth year molars. Bah! no wonder dentists are poor."

My friend retired from practice after twenty years of devotion to his work and lived ever afterwards like a gentleman.

HELPFUL HINTS.

BY C. F. RODGERS, D.D.S., CONNEAUT, O.

Use a saturated solution of salicylic acid in alcohol for canker sores, drying the gums well before applying.

If pins become loose in a vulcanite tooth, and you wish to replace same, flow a little thinly mixed porcelain body around them and bake in furnace.

In extracting roots which are decayed nearly to the top, leaving a mere shell, cut a soft pine peg to fit tightly in the root, drive to place and extract, when the stump will come with it.

Fusible metal is excellent for temporarily fastening a tooth on vulcanite plate. Dovetail well and hold tooth in place with moldine, pressing the metal in with hot wax spatula.

If point of tooth is broken off and you have no tooth in stock to match, remove the broken tooth from plate, build out with proper shade of enamel and bake. Broken blocks also can be neatly repaired in this way.

A lateral inside of arch, but directly back of its proper position, is a common occurrence. Fit a gold cap to the lateral, then back up a plate tooth, wax against the cap while in position, remove, insert and solder backing to cap. Look out for the bite.

One of the greatest conveniences in my laboratory is a block of hard wood, thirty-eight inches high and twelve inches square, on the right and left sides of which, flush with the top, are shelves eight inches wide. This block cannot be excelled for swedging of all kinds, as it gives a large, solid surface.

It is often the case in bridgework that the gums are so receded that the teeth must be made longer than were the original ones, so that when patient smiles about an inch too much tooth is shown at the necks. I have found that a very pleasing effect can be obtained by baking pink gum enamel on the necks of the teeth to correspond with the gums on the surrounding ones. If the teeth have been accurately fitted to the gums this work will hardly be noticeable. It also answers well for crowns. If it is done after the bridge is made, invest so that all gold is covered, just allowing the necks of the teeth to show.

To make a simple crown, prepare the root a little long at the back, well under the gums in front, burnish a piece of 34 or 36 gauge platinum, cut a little larger than the root, well over the end, lapping the edges well over the end, punch a hole directly over the canal, and in this hole insert pin, 17 or 18 gauge. Select a plain rubber tooth and fit to place, allowing the pin to pass between the pins on the tooth under the heads, bend the pins together so that they will grasp the pin tightly, wax all together and invest all in mouldine, pin side up. Melt out wax and solder all with as little pure gold as will just hold the different parts together. Place in investment material, build up well around the pins with low fusing body, mixed rather thin, dry well with spunk, and bake in furnace. After cooling, build on more body until the crown is properly contoured, and bake to a glaze.

THE REAL ATTITUDE OF THE DENTAL SPECIALTY TOWARD MEDICINE.

BY FRANK W. SAGE, D.D.S., CINCINNATI. READ BEFORE THE CINCINNATI
ODONTOLOGICAL SOCIETY, APRIL 26, 1901.

Before the recognition of dentistry as a specialty of medicine in the year 1892, thoughtful, ambitious men in the dental profession had long been turning this way and that, with expressions of intense yearning for relief from restrictions felt to be humiliating to an honorable profession. In dental meetings the question kept recurring, "Is dentistry a profession?" It was as if the dentists, having organized themselves into a nameless *something*, and having arrogated to that something the name "profession," had come to doubt whether fact and public sentiment sustained them in the position assumed. There was a half-appealing attitude toward the

medical profession for assistance in raising dentistry to a proper level. Frankly expressed, this appeal might have been worded thus—"What can we do to make our poor, nondescript, half-fledged profession respectable, and ourselves, its members, respected?" This refrain sounded throughout every discussion in the dental societies. Whether the theme discussed was the education of the public—that ignis fatuus of the dental convention—the relation of dentistry to medicine, or the preparation of the dental matriculate, the same familiar plaint constantly recurred. At the same time the attitude toward the medical profession was half defiant. It was the fashion for members who could think of nothing else to say, to arraign the physician for his presumed ignorance of dental science.

When recognition came, however, all this was instantly changed. A few independent spirits indeed were for repudiating the proffered honor, holding that dentistry had given as much to medicine as it had received. In the end, however, they waived their objections and joined in the general congratulations. Dentists everywhere felt an accession of dignity which took little account of the fact that in recognizing dentistry as a specialty of medicine the Medical Association in session at Washington had not proclaimed all dentists to be medical specialists.

While the result of that recognition was to greatly stimulate the dental profession, inducing many already in practice to take the medical degree, a large number of intelligent, capable men in the dental profession maintained that dentistry is nevertheless a distinct profession, developing its peculiar resources along lines which rarely, or at least only in a measure, converge toward those on which medicine progresses, and that it serves its patrons in ways and by means wholly foreign to those physicians employ. To the present day this view prevails with not a few. The situation is peculiar, unprecedented, significant of an anomalous relationship of dentistry to the parent stem, curious and interesting to the last degree. How did this come about?

The dental specialty, springing originally from medicine, as did all other medical specialties, seems to have required to be grafted upon another stock or, to extend the figure, to be even transplanted to another bed supplying nourishment of a description wholly different from that which served for the development of the other medical

specialties. In one or two respects only the dentist's service to his patient resembles that of the physician or the surgeon. He may exhibit remedies or employ surgical interference, but this office may be merely preliminary to a peculiar service which is to follow, something wholly extraneous to medical science, while the physician's ministrations begin and end with a prescription. Herein is dentistry unique. No other specialty of medicine furnishes its counterpart. No other specialty could have so developed along lines of its own selection, appropriating empirically such principles of practice and such remedies as suited its purpose, and yet finally attain a success practically untainted by empiricism. In earlier days the dentists, perplexed and unable to solve pathologic or therapeutic problems, either stumbled helplessly over them or passed by on the other side, finding them after all not absolutely essential. What knowledge the dentist acquired of *materia medica*, pathology, and other branches of medical science, he got by inductive processes, formulating no principles covering classes of cases in practice. Yet despite these drawbacks of ignorance, the science and art of dentistry have finally rounded out to the proportions of a legitimate specialty of medicine. What less than a miracle is this?

Conceive if you can of the oculist attaining to perfection of skill after the manner in which the dentist of seventy or eighty years ago set about to learn dentistry. Imagine a man dropping his carpenter's plane to enter the office of an oculist of acknowledged skill, with a view of learning to be an oculist. He buys a copy of "The Principles and Practice of Optical Science," into which he occasionally dips, when in difficulty. His main reliance for information, however, is in watching his "preceptor" and imitating his processes. We see him remove crystallin lenses for patients, and retinas, and we observe that the patients go away evincing no consciousness of having suffered irreparable loss, but rather seem joyous over their relief from pain. Now we see our student working hours fashioning glass eyes, which later his "preceptor" inserts for a waiting patient. We hear him say, "You must persevere in using these, and before long you will be able to see with them quite as well, if not better, than you ever could with your natural eyes." Later we see the preceptor operating hour after hour for another patient, repairing a natural organ. "You should remember, sir, that one natural eye is worth a dozen glass ones," he replies to the

patient's remonstrance against the exorbitant fee. Such it seems is the duplicity of oculists!

Now further picture the student after two or three years' instruction under this able teacher pursuing practice on his own account, year after year accumulating fame and honors. Failures he occasionally has, but no death is ever charged to him, no whisper of malpractice ever assails him. This picture, preposterous though it seems, needs only slight retouching to pass for a faithful presentment of the dentist's schooling not so long ago. It must appear that the oculist could never so much as make a start in the direction of success unless he had first traversed the entire field of medical science. He must be competent at the outset to trace from symptoms disclosed in the eye such disorders as syphilis, paralysis, locomotor ataxia, the various anemias, and other diseases. His patient knows without special prompting that irreparable loss may follow the slightest error of diagnosis or treatment, while the popular estimate of the dentist's responsibility is expressed in a wide-spread belief that he can fall into no error which a pair of forceps deftly wielded will not correct.

It appears then that the comparative unimportance of the dentist's service, for one thing, accounts for the fact that dentistry has so long been left to its own resources, but an element liable to be overlooked has had much to do with the dentist's confining himself to so comparatively narrow a field. It is the time required for the service rendered. While the oculist may wait on ten to a hundred patients daily, and still spare time for hospital work or the lecture room, the dentist may be all day long treating and filling two or three teeth for a single patient.

Here then are facts which seem to account for the present attitude of dentistry toward medicine; an attitude not lacking in friendliness, yet expressing, as many believe, a feeling of incompatibility. The dentist who is of the fibre to be a leader among dentists is essentially mechanical in his instincts. He may possess the instincts of the physician as well, but his bent is mechanical. Whatever is to be done for improving the status of the coming dentist will fail of its purpose if it be not kept strictly in mind that he must remain a dentist. It is possible that the question of affiliation with the medical faculty must be relegated to the rear, in considering what the crying need of dentistry actually is. No mere sentiment

referring to the elevation of the profession by factitious means is to be considered. We cannot dignify dentistry by making it over into something else, even though that something else be medicine. Dentistry needs no dignifying. Its individual members through their individual personal influence confer upon it or withhold from it the only dignity worthy of the name. The public cares nothing for us as a profession; it takes cognizance of us only as individuals, or as groups of individuals, and chooses from among us such as it deems best qualified to minister to its peculiar needs. But the age of superstition is not fully past; the occult in medicine has had much to do with the physician's being esteemed above the dentist. Even that, however, is passing; so great a man as the lawyer, once supposed to outrank all other professional men, has come to be irreverently spoken of and to have his fees criticized.

The true standard of respectability in any profession is an individual standard. The dentist who is by nature, education, and breeding worthy of the respect of his patrons usually finds no occasion to lament that his profession is not respectable. He may regret moving along a narrow path, but he has no vain yearnings after the merely adventitious aid of a title. The attitude of dentistry toward the medical specialty is a composite of the attitudes of its thousands of individual members. One dentist expresses in his attitude a genuine desire to know more of medicine in order that he may do more and better for his patients. A second is impelled by pride to seek a more honorable degree than that of D.D.S., having a regard for the prestige the title may confer. A third cares nothing for the mother science. A fourth is openly hostile to the suggestion that dentistry needs any assistance from the medical profession. This composite picture requires to be studied with relation to any and all suggestions for improving the status of dentistry and the dentist. We may rule incompetent men out of the profession, but we cannot rule out temperament or natural aptitude. We cannot coerce men who have a taste for dentistry and none for medicine into the medical fold. These matters the dental college must deal with, for the medical college could not supply to its students a knowledge of dental science, to say nothing of a knowledge of dental art, if the dental college were abolished. Dentistry must be greatly improved, both as to its science and its art. The picture of the rise and development of dentistry portrays after all only a sorry success. The

mischievous wrought by unscientific men during those long years of development—who can tell!

The history of all important reforms shows that the exciting influence comes from without the circle of the distinct organization, whatever it may be, but the active agencies by which the reform is set afoot spring up from within the organization. Granting that this picture of the attitude of dentistry toward medicine is a fair presentation of facts, there remains still to be considered the attitude of the public toward both professions. The dentist's patrons are satisfied with his services so long only as they believe them to be the best the science and art of dentistry are capable of supplying, but as a matter of fact they find so much of imperfection in his ministrations that the question of the why and the wherefore of failure is constantly being suggested to him. So that he in turn is constantly asking, How can I improve my services to my patrons? That is, if he is really possessed of the progressive spirit. Which finally brings us face to face with the question, whether the great mass of the profession, including the progressive and non-progressive, are likely to be considered in any proposed measures for improving the dentist's status. Foremost of all questions is, what is the best that can be done for the education of the number of dentists adequate to the popular demand for dentists? It is not perhaps an unfair assumption that the leaders of our profession, those who have done most for the science and art of dentistry, should be the only arbiters of this question. It cannot be delegated to the medical profession to prescribe boundaries and determine final principles on which the coming dentist's education shall be conducted. That falls inevitably to the lot of the dental profession.

Discussion. *Dr. J. S. Cassidy:* The high standing of medical men is not due to any superior knowledge but to the mystery surrounding the remedies and treatment. In early days medical science was far from perfect—fever patients were not allowed water to drink, the sick were not given the food which they required, blood-letting was constantly resorted to, and the methods of treatment were all wrong. I have always believed that a dentist could properly cover his field without going through a medical school. Nevertheless, the more a man knows of medicine the better equipped he is. For instance, in order to give anesthetics intelligently he must know something of physiology and pathology. We cannot consult with

physicians regarding diseases of the teeth, as they are for the most part absolutely ignorant on this subject. I have had physicians come to me and ask to have pulps killed in abscessed teeth. Medical men will frequently treat a dental case for years which a dentist could relieve in ten minutes. How often have physicians and surgeons cauterized for months a running sore, due to a dead pulp in a tooth, which has healed spontaneously after a good dentist fixed it up.

Dr. C. M. Wright: The late Dr. McKellops was one of those who was opposed to accepting the honorary degree from a medical congress. For my part, it does not matter whether physicians acknowledge us as specialists or not, since it is patent to all observers that along certain lines we are one and the same. I agree with the essayist that the respectability of the profession is in the hands of its individual members.

Dr. T. I. Way: One disreputable member of the profession can do more to injure us in the opinion of the public than the example of a dozen reputable practitioners can do to help us.

Dr. M. H. Fletcher: Of all professional men the dentist needs the best equipment for practice, and he must have a medical education in order that he may know systemic conditions, temperament, etc. Without it he may not even succeed in that work which some insist is the principal and sole function of the dentist. At present the dental colleges do not teach pathology thoroughly enough. It is true that individual dentists make their own standard of respectability, but it is also true that the public estimates us according to long recognized standards.

Dr. A. A. Kumler: With a large number of the profession the distraction of studying two sciences and the dividing of individual energy would result in a lessening of the dentist's ability.

Dr. O. N. Heise: It is the individual in dentistry who has established the standard by which the public judges us, which fact gives a peculiar emphasis to the assertion that the dentist must know more in order to be rated higher, for as a dentist he ranks only as a dentist. The important thing is not that he acquire the medical degree, but that he shall be able to manage a case requiring medical knowledge and experience just as well as the physician, for it is seriously to the disadvantage of the dentist that he is ever forced to the necessity of calling in a physician. Dentists need more thorough education, and I do not believe a first-class dental

college compares with a first-class medical college in teaching pathology, physiology, materia medica, etc.

Dr. C. M. Wright: I must protest against the statements of Drs. Fletcher and Heise, that general pathology, physiology, etc., are taught more thoroughly in a medical than a dental school. I teach general—not special—pathology, the broadest kind of philosophical pathology, in a dental college, and find that graduates from medical schools, placed side by side with dental students, rank second to them. Several years ago I refused the degree that these "M.D., D.D.S." men appreciate too highly, because I believed that a dentist need not be ashamed of his calling; furthermore, none of my medical friends would think any more of me for having the title of M.D. These dentists who also hold the degree of M.D. (Mystical Doctor) try to impose on us plain D.D.S.'s and pose as something higher and better. I never advise a dentist to try for the M.D. degree. It spoils him. There is a tendency developed toward encephalic hypertrophy.

TIN—A PLEA FOR MORE CONSERVATIVE METHODS IN FILLING TEETH.

BY T. D. SHUMWAY, D.D.S., PLYMOUTH, MASS. READ BEFORE THE VERMONT STATE DENTAL SOCIETY, MARCH 21, 1901.

In submitting this subject for your consideration, I wish to disclaim any intent to show superior manipulative ability in the use of cohesive gold, or to merely demonstrate by a novel experiment the possibility of uniting gold with tin by simple contact. If this were the only reason for appearing before you, it would be well not to consume valuable time which could be more pleasantly and profitably employed. I trust that in this society the day has gone by when exhibitions of this character can excite either wonder or admiration. That there have been demonstrations of this sort far beyond the mechanical skill of your essayist to excel or even emulate, no one is more willing to concede than he. It is for the purpose of presenting the hackneyed subject of filling teeth in a somewhat different manner from that in which it is usually treated that the above title was selected and these specimens of the work submitted for your inspection. These specimens are not intended to be like those made with cohesive gold and the mallet. In their physical

construction they are radically different. Whatever value they possess arises from this fact.

Failure of Cohesive Gold.—Had the use of cohesive gold and the mallet met the expectations of the profession, it would be presumptuous indeed to attempt to offer anything in its place. It is true, the skill displayed in the repair of wasted and broken tissue by contouring has been something remarkable. Manual dexterity has reached a high state of development, but the results obtained have been at a fearful sacrifice of tooth structure. History repeats itself, and the same objections to those faults which caused the failure of crystal or sponge gold nearly fifty years ago, apply to any form of cohesive gold when placed in contact with tooth substance by mallet force. In the discussions on the use of crystal or sponge gold it was pointed out what would follow this plain violation of natural law, in impaired or arrested function. In an article by Dr. J. De Haven White, published in the *Dental News Letter* of July, 1854, the writer says:

“It is believed by some that a plug must be impervious to dampness; this cannot be, for if it were, it would not be necessarily a perfect plug; dampness must permeate a plug to some extent, or the dampness will force around the plug and displace it sooner or later. We know well that a distinguished operator in our city loses more hard plugs than soft ones on that account; his plugs are therefore better than the teeth he puts them in. We do not wish to be understood as advocating hard plugs, but we believe the most perfect plug is of about equal porosity to the dentin; with a good cavity it will remain in longer than a harder plug, especially in the lateral portion of the teeth. A foil plug will not be broken up by such permeability, and a sponge plug will. No reasonably good operator loses a plug by softening, but by the margins of his cavity giving away. The constant expansion and contraction of the plug and the tooth will cause any plug to give way sooner or later, and until we get a substance that will expand and contract with the tooth, so as not to loosen its margins, we will have some of our highest specimens of art crumbling away under our eyes.”

It is evident that Dr. White had an intelligent understanding of structure and function. As a student of vital energy he was able to discern the cause of failure in the use of crystal or sponge gold. Manipulating cohesive gold by the more modern methods does not remove the objections which he so forcibly stated. The introduction of the rubber-dam made possible operations which before were only

partially successful, but the evil was augmented in a more thorough crystallization of the gold by mallet force.

That many teeth have been filled with cohesive gold and the mallet, and that the fillings have remained for a great number of years, no one will attempt to deny. There are many people that have survived and enjoyed a comfortable degree of health, who have violated the laws of correct living. There is a wonderful recuperative energy in the human organism. But for this it is a question whether the race would not long since have become extinct, by reason of transgression of natural law. Admitting that some teeth which have been filled with cohesive gold and the mallet are doing good service, we believe this is due to the recuperative energy that was able to overcome the contact of a foreign body incompatible with tooth structure, rather than to the influence of the filling itself. With the record of failure, it is fair to say the success of filling teeth with cohesive gold has not been commensurate with the amount of labor bestowed, the physical exhaustion, mental strain, and nervous tension on the part of the operator, together with the pain and suffering the patients have been made to endure. It is significant that crowns, bridges and inlays should follow so closely in the track of cohesive gold and the mallet. It is also significant that those who became the most expert in using gold in this form were early in the field to adopt the later method of cutting off crowns.

Etiology of Tooth Structure.—When the mallet was introduced for the purpose of condensing cohesive gold, it was assumed that because lost tissue could be restored the teeth would be preserved by purely mechanical means. Operative dentistry or the care of the natural teeth, like the practice of medicine, is not an exact science, although it has to deal with scientific subjects. Nature rebels at any attempt to reduce her methods to exact mathematical lines. This is clearly demonstrated by a study of structure and function in tooth development. This study is necessarily prosecuted under difficulty, for no one is privileged to see the secret workings of nature. The microscope can reveal only what has taken place, not what is going on in this workshop. If we could examine under the lens without first destroying the vital force, what secrets would be unfolded! It is by reasoning from what we know that we are able to reach conclusions which are to guide us.

In the discussion of this subject the first inquiry then is, how is

a tooth developed, and what are the changes wrought in this wonderful organ from its beginning to old age, or, in other words, how is a tooth built? At its inception there is the dental arch, in which appears a groove, and across this groove, which divides it into pockets, there shoots a thin porous bone. In the pockets are follicles, which are the germs or buds of the future teeth. These follicles are connected with the circulatory system by arteries from the internal maxillary branch of the external carotid; veins from the internal maxillary vein, which return the blood and terminate in the external jugular; and nerves from the fifth cerebral or fifth pair. Here we see that every pulsation of the heart sends forth the material for tooth formation. Embryologists tell us that at the end of the fifth or beginning of the sixth month of fetal life the process of enamel formation is about to commence. The cells which form the external epithelium or Nasmyth's membrane have performed their function and disappeared. This membrane has a polished surface, and is a covering for the prisms or rods which are to form underneath. These are held together by what is termed a cementing plasm.

Formation of Enamel.—In the formation of enamel is first seen the form of the future tooth in a cutting edge for an incisor, and a cusp for a bicuspid or molar. The enamel organ when completed is a purely crystalline formation, and according to the best authorities is without any trace of organic matter. All crystalline bodies are formed from without inward, and enamel formation can be no exception to this rule. A little reflection will make this apparent. Take, for example, the shell of a lobster or the skin of a snake. When a lobster sheds its shell it is provided with a membrane similar to the outside covering of enamel of the teeth, which is highly polished but extremely tough and flexible. In the process of time there is formed underneath and attached to this membrane a calcareous deposit, crystalline in character, varying in thickness from one-sixteenth to one-fourth of an inch. We can readily see how impossible it would be for the lobster to shed its shell but for this crystalline process taking place from without inward. Nature provided an inorganic covering which acts as a protection during the process of calcareous formation. Suppose the process to be reversed? It would mean simply the death of the lobster. After the new shell is formed another membrane appears, and in due time the old shell is thrown off and the lobster comes forth increased in size. In no

other way could it get out of its environment and expand and grow. What a beautiful sight is a black snake that has just shed its skin—so black and glossy! Now this new skin is pure crystal, and is formed in the same manner as the lobster's shell, only differentiated to meet the habitat of the snake. Nature had to provide an inorganic covering to prevent the snake from being torn and bruised by the stones and bushes over and through which it crawls.

On a cold winter's day watch the process of crystallization on the window pane. It is always from the sides toward the center, and never from the center outward. This is the key that opens the secret chamber of nature and reveals the process of enamel formation for the teeth. When once formed the enamel plays no part in the life of the organ, any more than the lobster's shell or the snake's skin, except to act as a protecting covering. The enamel of a tooth is the only part of the animal economy which does not undergo decomposition or change. Professor R. R. Andrews says: "The finest lenses do not reveal the slightest differences between enamel ground from a living tooth and that which has lain in the ground for centuries."

Formation of Dentin.—The growth of dentin is by a process the reverse of that by which the enamel is formed; that is, its growth is from within outward. Unlike the enamel, it is composed of two distinct parts, minute tubes and a fibrous tissue called the uniting medium. In their arrangement these tubes radiate from a center. Tomes says, "The center of radiation is the pulp cavity." These tubes ramify in undulations not only towards the enamel, but also dip downward to form the root of the tooth. They also extend through the sides of the root and are lost in the cementum.

This fact should have an important bearing in the treatment of pulpless teeth. As yet we have only the framework of a tooth. It is like a house under process of construction, with an outside covering and partition walls. In the work of tooth-building these tubes perform a very important function. They are filled with a substance that is given off from the pulp, which so far as the microscope can determine is amorphous or structureless. This substance, granular in character, changes into a lime salt. This change is going on from the time the tooth is formed until the period of extreme old age, when the pulp almost entirely disappears. There is no part of the human organism where the process of change is

carried on more continuously than that which takes place within the teeth. Although the teeth are provided with an indestructible covering, they are the victims of disease.

From some cause, which it is not necessary to inquire into in this connection, the enamel becomes abraded and the dentin is attacked by caries. Nature has provided for attacks of this kind by making the point where the amorphous substance is changing into a lime salt the most sensitive part of the organ. She at once sets up the work of repair by a secondary deposit of dentin. The sensation of pain which is experienced is not only a note of warning but a cry for help. This cry is for a protecting covering. If the waste is greater than the repair it means destruction of the organ. The more recent investigations have shown that the work of repair goes on even after the pulp has become inflamed.

Dr. A. Hopewell Smith of London, in a paper on "Certain Adventitious Dentin Associated with Inflammatory Conditions of the Dental Pulp," says that "in the majority of the inflammations, but by no means in every inflammatory condition of the dental pulp, there is found a protecting layer of hard adventitious dentin, which is put by caries of the surface in the place of danger; that is to say, opposite the breach." Here we see the effort of nature to protect herself even after the struggle has become hopeless. From this it would seem that operations upon the teeth to stay the inroads of caries should be protective and remedial. The dentist cannot save teeth any more than the practitioner of medicine can cure disease. Nature must work the cure. The aim of operative dentistry should be primarily to assist nature, not a display of mechanical skill in disregard of fundamental law.

Materials for Filling Teeth.—A study of the materials to place in contact with tooth substance is the first requisite, if we would approach the operation scientifically. A crystalline formation is obstructive when placed in contact with a living or fibrous body. No one could expect to ripen apples by filling them with gravel stones. If you should shoot malleted fillings of cohesive gold into the body you would invite blood poisoning. The same law governs in the more dense substance of the dentin, which is filled with life. Again, it should not be anchored with dovetails, angles, retaining pits, etc., as nature is above mathematics and refuses to be bound. This is the reason why Dr. White says, "The filling should expand

and contract with the the tooth" to meet the changing conditions. An amorphous substance which is undergoing a metamorphosis demands that the material to be placed in contact with it shall be structureless as itself.

Success with Tin.—An illustration of this is seen in the way lead or tin becomes encysted when buried in the soft tissue. Of all the materials that have been employed as a tooth stopping there is none which has shown such preservative properties as tin. It has a history and a record as old as operative dentistry. In 1825 Mr. Sigmond of Bath, England, said: "In 1783 I stopped a considerable decay in a large double under tooth, on the outside of the crown or near the gums, with fine tin foil, which lasted for a good number of years." The saving properties which tin exhibits when placed in a carious tooth are well established. The testimony of many skillful dentists bears witness to this fact. The reasons that have been given as to why tin exhibits this property have been numerous and varied. Some have attributed it to a therapeutic property in the metal; others, like Dr. Palmer of Syracuse, claim that it is positive to electro-chemical action, and some, like Dr. Miller of Berlin, say that it is germicidal. When compared with other metals tin may be said to be almost amorphous. Its specific gravity is 7.29; it melts at 442 F., a little more than twice the boiling point of water, Gold is more than four times as tenacious and six times as good a conductor of heat. Under the same conditions tin expands nearly twice as much as gold, but the rate of expansion of gold is nearly twice as much as tin. Here is a metal that in its physical characteristics borders upon the structureless. When tin is placed in contact with the amorphous substance of the dentinal tubuli it acts as an assistant in the effort of nature to protect herself from untoward external conditions. This, it would seem, is the more scientific reason for its benign influence.

The limitations of tin have been the barrier to its general use. These limitations are its color, softness, and the tendency to what is termed oxidation. Various methods have been suggested to meet these objections, one of them being to make a cylinder of tin and gold foil, and then force this into place, either by the wedging process or the mallet, but this method has been only partially successful. Incorporating gold with tin destroyed the attractive appearance of the gold, and the tin would oxidize and wash out when it came to the surface.

Tin and Gold.—The idea of covering tin with gold is not new. It was practiced nearly fifty years ago. The method was to force the gold into a base of tin with a sharp instrument, with the object of simply cheapening the operation. This was the only value the author claimed for this method. In the *Dental News Letter* of January, 1856, in a communication by Dr. F. Y. Clark on "Material Used in Filling Teeth," he says:

"Now as gold is too costly, and tin is too soft, what are we to do with those poor patients that are continually seeking our aid? The plan that I adopted two or three years ago I find as yet works well. At first I had many misgivings on account of two metals being placed in contact in the same tooth, but I can see no difference in placing two metals in contact in a tooth than in placing them in contact around it. But I think the evil is more imaginary than real, for so far I have not been able to detect the least trouble. Therefore, when I have a patient who is not able to pay me the worth of the gold used (I speak of teeth with large cavities on their grinding surface), I commence with tin, and fill up to the fangs (if I have removed the nerve), also the pulp cavity, and as much of the crown as I safely can. I pack the tin in perfectly hard, leaving or making it flush, and then with annealed number four gold foil I finish off. I use number four because I find it can be forced into the little threads in the walls of the cavity better than any other number, when annealed. Now I cannot see why such a filling is not just as good as if it were all gold. The tin cannot wear nor corrode, for it has not the slightest chance, and the gold on the surface is hard enough to resist all antagonists of the mouth, and as the cost is not more than one-third as much as it would be if it was all gold, we can get pay for the gold if not for our work. I always adopt this plan when I have to fill a tooth on the grinding surface, from which I have taken the nerve, for less than six dollars. In the incisor teeth tin or any other metal but gold should not, of course, be used. All cavities that can be filled with tin can be filled equally well with gold; therefore, we have no inducement to use tin but its cheapness."

It evidently did not occur to Dr. Clark that he might possibly be giving a better service for smaller compensation to his poorer than to his more fortunate patient, who was able to pay for all gold. The method he used was solely for the purpose of economy. The idea that a filling must be in harmony with its environment, and not obstruct but aid nature in her work of repair, formed no part of his method, as the object was to get something cheap. The value of a filling depends upon its ability to save teeth, without regard to the cost of the material used. The only other consideration is that

it shall offend the eye as little as possible. If the theory that tin exercises a benign or healing influence when placed in a carious tooth be sound, the problem is how to eliminate its objectionable feature and extend the boundary of its usefulness. A cavity filled with tin, with an outside or protecting covering of cohesive gold laminated, so as not to incorporate the gold in the tin, is in correspondence with nature, and more fully meets the demand of its surroundings.

Much that has been said in condemnation of tin as a filling material is proved, on examination, to be without good reason. That tin foil, when made from the pure metal, disintegrates or becomes powdery is shown to be false. It is a mistake to charge tin with making the teeth black, when really it makes them of a brighter hue. Remove a tin filling after it has been in the cavity of a tooth for years, and the dentin will present a bright, healthy, dense appearance. Tin never penetrates the tubuli like amalgam.

Method of Using Tin for Filling Teeth.—But it may be urged that all this sheds no light upon the most important part of this subject, i. e., the practical application of how to fill teeth with tin so as to remove the objections and retain its virtues. In filling teeth the first step is the preparation of the cavity, and in the use of tin there are no exceptions to the general principles laid down in the various text-books. Unsupported walls of enamel are to be broken down and the decayed dentin removed. In doing this, however, no more tooth structure need be sacrificed than is necessary to accomplish the result. Being interdigitous, tin spreads laterally, and does not need angles, dovetails, undercuts, or retaining pits to hold it in place. It is not refractory like cohesive gold, which stays only when it is anchored so that it cannot get away, but yields readily to pressure. It remains in place, not from necessity but from choice. The removal of healthy tooth structure for retention is not required. It does not call for "extension for prevention," as tin itself prevents extension. By reason of this saving of tooth structure many fillings may be almost entirely concealed.

Tin is introduced and manipulated in the same manner as has been so often described in making cylinder fillings—by the wedging process. It should be condensed into a solid mass so that it may be cut with a sharp chisel or excavator. This is best accomplished by heating the plugger in an alcohol or gas flame to a degree to

render the tin malleable. This requires about 212 degrees F. The sensation of heat which the patient experiences is not so acute as that which follows the introduction of hot gutta-percha, provided it is done with judgment and care. When the tin is consolidated it should be flush with the enamel walls. So far the work is done with the old-fashioned hand pluggers with large handles. The next step is to bring the flattened surface of a very light and extremely cohesive gold cylinder in contact with the surface of the tin, when a union of the metals takes place at an insensible distance, like the uniting of two drops of water. Continue this process until there is an outside covering of gold, which will finish down to a smooth and polished surface. For finishing, all that is required are sandpaper and cuttle-fish disks and strips. It does not need to be burnished, as burnishing tends to impair the union of the metals by drawing the gold away from the margins.

All crystalline bodies under force or pressure assume a definite form. The crystals of gold being spheroidal, the tendency under pressure is always toward the center. The same law which governs in the vital organ should be recognized in the treatment of pulpless teeth. It is a misnomer to call a pulpless tooth a "dead tooth." It is true that the process of tooth building is stopped with the death of the pulp, but as the tubuli extend through the sides of the root, a certain amount of vitality may be maintained under proper treatment. This treatment should be in a way to cause as little change as possible in the conditions under which the tooth was formed.

There can be no question that tin in the root-canal is as bland as it would be if encysted in the muscular tissue. Clinical experience has demonstrated that a root properly filled with tin will remain perfectly odorless, while one filled in the same manner with cotton and cement, or gutta-percha, almost invariably gives off a most offensive odor on being removed. This odor is of the kind called "brassy" and is, no doubt, largely due to a decomposition of the amorphous substance which has been arrested in its metamorphosis. A similar odor is often detected on removing a cohesive gold filling which has been placed in a living tooth with great care.

The question which naturally suggests itself is, will a filling of this kind stand the tests of crushing stress equal to those of cohesive gold or amalgam? Dr. White says, "The best filling is one of about

equal porosity with the dentin." Hardness, or the power to resist force when applied out of the mouth, is not a scientific way of testing the value of a filling when placed in a tooth, as the conditions are in no way similar. As before stated, the object is to obtain a filling that in its physical construction shall as nearly as possible conform to the healthy organ. The teeth are not set in the sockets the same as a post is put in the ground. They are cushioned in the jaw and give way under pressure. Besides, the material of which they are made is the most elastic of any known substance. For this reason billiard balls are always made of ivory.

There have been many teeth filled on the grinding surface with tin that have worn out in the center, and yet have protected the walls of the cavity sufficiently to permit nature to make a secondary deposit almost as dense and hard as the enamel with which it was originally covered. A secondary deposit of dentin under a malleted cohesive gold filling would be rare indeed. How often do we see teeth crumble away while these fillings remain intact. It is more scientific to have the fillings wear and save the teeth than to have the fillings remain and the teeth decay. In one case the filling may be easily replaced; in the other the organ is lost while the work remains. This is not intended to cast any doubt upon the ability of the fillings we suggest to withstand the force of ordinary attrition, when placed in any part of the mouth which has been affected with caries. A practical application of this method in many different positions has convinced your essayist of the correctness of the principle that correspondence and harmony and not "crushing stress" are the true factors in tooth preservation.

The points I have endeavored to enforce are—first, that the enamel of a tooth, being formed from without in, plays no part in tooth development or preservation, except to act as a protecting covering; that the process of tooth building is from within out, and and continues from infancy to old age; that nature attempts to protect herself from the encroachment of disease by a deposit of secondary or adventitious dentin; that if the cause of decay is external the recuperative force is from within; that the operation of filling teeth should be based upon a recognition of these processes of nature, and that the material when placed in contact with the dentin should be in correspondence with the amorphous or structureless substance with which the tubes are filled; that of all the materials

which have been employed tin most nearly meets these conditions; that the objection to tin of color, softness and a tendency to oxidation, are met by proper manipulation and the field of its usefulness extended; that it suggests a theory of practice scientifically correct.

If these conclusions are well founded, it removes from the operation of filling teeth the empirical and the doubtful, and inspires the patient with confidence and hope. Being in harmony with natural law, it lifts a burden from the shoulders of the practitioner, and makes a pleasant duty of an irksome task. Having a scientific basis for its foundation, it elevates the standard of dentistry and lends dignity to a worthy calling. Above all, it mitigates the pain and suffering attendant upon operations in the mouth, from which even the most heroic shrink.

"THAT HORRID TOOTH."

[The following poem was published over seventy years ago, and was committed to memory by Rev. S. P. Heath, Gilford, N. H., then eight years old, whose father paid him two cents for doing so. While in the office of Dr. E. B. Cushing of Laconia, N. H., recently, he repeated the poem, and at Dr. Cushing's suggestion sent it to the *DIGEST* for publication, as affording a good illustration of the progress made in dentistry since that time.—ED.]

I smoked twelve boxes of cigars;

'Tis nothing but the truth.

I chewed tobacco many pounds

To soothe my aching tooth.

I filled it up with opium,

I ate scarce any food;

I swallowed quarts of ague drops,

But ache the grinder would.

At last I vowed "I'll have it out,"

And to the dentist went;

But when I sat down in his chair

My vow I did repent.

For when his awful instruments

Were ranged before my sight,

I jumped full five feet from the floor,

And yelled with all my might.

"My friend," said he, "I'll draw your tooth
With less degree of pain
Than any dentist in the town;"
So I sat down again.

Then he took hold with his savage hook;
I uttered a loud cry.

"Dear Sir," said he, "I hurt you not."

"Dear Sir," said I, "you lie."

He gave the most infernal wrench;
I wished that I were dead;
For all the torments in the world
Seemed centered in my head.

He pulled, he tugged, then out it came,
That horrid tooth of mine;
The monster nearly broke my jaw,
And charged me six and nine.

ABSORPTION OF TEETH IN AN ADULT.—Mr. Headridge describes (*Jour. Brit. Dent. Assn.*) a case of absorption of an upper left lateral incisor and of an upper right central in a healthy man of about forty-five years of age. In the case of the central incisor the root had undergone almost complete absorption, while in the case of the lateral the alveolus was the seat of the same process. No painful phenomena were experienced, and excepting a slightly plethoric condition of the gums no disagreeable symptom was observed. This case is a curious one in view of the fact that the patient enjoyed exceptionally good health.

GOLD FILLINGS IN PORCELAIN TEETH.—By Otto Arnold, D.D.S., Columbus, O. A novel method for making so-called gold fillings in artificial (porcelain) teeth by the use of china decorators' gold paint. The tooth is prepared by grinding off the enamel at the desired spot to a concave shape to afford thickness of material, and with well defined margins to allow of a proper finish. A thin coating of the gold compound is applied to the prepared surface with a brush, after which the tooth is fired in a gas or electric furnace. When cooled remove and a layer of gold will be visible where the compound was applied. If this layer covers the surface uniformly, gold foil or pellets can be made to cohere to it under similar conditions that obtain in ordinary gold filling operations. The advantage of this process is being able to produce artistic effects without materially weakening the artificial tooth, as in the case when undercuts for retention are made. This process may also be utilized for porcelain inlay work, using amalgam as the retention medium.—*Ohio Jour. Jan. 1902.*

Digests.

MICROBES OF DENTAL CARIES. By J. Choquet, Chief of the Bacteriological Laboratory and Professor in the Dental School of Paris. Read before the International Dental Congress at Paris, August 8, 1900. In writing this paper we have not undertaken the study of all the microorganisms of dental caries, but it has been our aim to specialize that point of which the etiology has as yet not been studied, namely, the recurrence of caries under fillings. When we say fillings we mean those that have been carefully inserted, the cavities thoroughly cleansed and correctly prepared; we also have reference to good filling materials. It is too absolute to affirm, as Dr. Cruet does, that recurrence of decay does not take place if the cavity has been carefully prepared and cleansed and a layer of white and hard dentin left in the bottom. Prominent practitioners who combine their clinical observations with those of the laboratory, more especially the microscope, are diametrically opposed to this opinion. They have proved what they advance. Dr. Galippe says it makes no difference with what amount of care the cavities have been prepared, and it does not matter what antiseptics are used to secure sterilization, there will always be found tubuli invaded by microorganisms. Dr. Miller, in his paper on the comparative rapidity of penetration into decalcified dentin of different antiseptics, says that the practice of superficially bathing cavities of decay with an antiseptic before inserting the filling was followed by many practitioners even before the appearance of the microbe theory; that the practice is universal, and its object is the devitalization of the germs which may have been left in the deeper layers of dentin.

In an article we find the following statements: "There are few practitioners who place so high an estimate upon their own skill and thoroughness as to imagine that they excavate every cavity perfectly." Further on, "It may appear remarkable that, while so much attention has of late years been bestowed upon the antiseptic treatment of root-canals, very little attention has been given to the subject of the antiseptic materials for filling cavities of decay." In an interchange of letters which took place recently between Williams, Wedelstaedt, and Grayston, Grayston says, "The dentin which seems hard under burs and excavators can nevertheless be entirely infected." Dr. Williams, while contending that there are very few chances for the recurrence of decay under a gold filling after ten years, admits, nevertheless, the possibility. We are of the opinion of Galippe and Miller, and we also believe that notwithstanding all the care used in the preparation of a cavity and its subsequent filling we can never affirm that there will not be a recurrence of decay. We do not in this include caries arrested by the

formation of secondary dentin, as we would in that case go out of the limits of the question. How is it possible to explain those cases in which we find perfect fillings of amalgam or cement inserted for five, ten, fifteen, twenty, and even twenty-five years, and that under these fillings we find softened dentin, more or less discolored, which in time will cause complete destruction of the pulp? We take it for granted and set it down as a principle that those fillings were good, and that there was no space or interval in the continuity of the filling and the walls of the cavity. It is necessary to admit in such a case that the cause is an internal one, and that it has developed as the consequence of the presence of certain microorganisms left in the tubuli of a kind of dentin which appeared to the eye and touch healthy.

It is to these species of slow development that we have directed our attention and efforts. Out of three filled teeth in which the fillings had been preserved intact we succeeded in isolating and studying specially five species of microbes, which we will designate under the Roman numerals I, II, III, IV, V. These teeth were extracted for these reasons: 1. A lower left second molar in which the buccal surface had been filled seven years before was extracted to prevent trouble accompanying the difficult eruption of the third molar. 2. An upper left second bicuspid with a filling in the mesial surface was extracted to facilitate the regulation of the cuspid. Filling four years old. 3. Upper right third molar; occlusal cavity; amalgam filling three years old. Tooth extracted on account of pulpitis. We inserted these several fillings, using all necessary care and taking the precaution of moistening the bottom of the cavity by means of cotton saturated with an antiseptic solution. The number of microbes found under these fillings was much less than was found in the superficial and even deeper layers of decayed dentin when in contact with the oral fluids. These five species, without being entirely anaërobic, nevertheless present a marked tendency to grow better in the absence of oxygen. In regard to particular properties, they present marked variations. They develop very slowly in the culture-media generally employed; nevertheless, in the course of time and as a consequence of their development, which for five years has taken place out of their own medium, they seem to have gotten acclimated and grow now with great rapidity. The morphological characteristics have not suffered any change, while the chemical reactions, weak at the beginning, are to-day entirely changed in one way or another. Certain species grow only at the temperature of the incubator (36 to 37 degrees C.) while others grow just as well at ordinary temperature. We have been unable to find a similarity between these species and those heretofore described, except that we suppose Nos. III and IV to be a variety of pneumococcus. These five microbic species can be subdivided into three classes of

micrococci and two classes of bacilli. A description of them will be given later.

Experiments of Inoculation.—The study of the etiology of caries, notwithstanding the difficulty of finding an appropriate medium for the separate culture of the different species, became a very difficult task when the attempt was made to produce artificial caries, not on teeth out of the mouth, but on tissues of living animals—on teeth of physiological animals. We have been unable to find records of this kind of experiments in any of the works treating on the etiology of dental caries. Underwood and Milles, Miller, Goadby, and Williams produced artificially the disorders of caries on tissues which did not possess the physiological integrity necessary for this kind of experiments. These experiments were made in some cases on teeth placed in some special nutritive media approaching as nearly as possible the chemical composition of saliva; in others they were carried on on calcified or decalcified longitudinal sections similar to those used in microscopical examinations—always on dead organs devoid of the physiological integrity which ought to be reckoned with in this kind of experiments.

We tried to do better in order to approach as closely as possible to the phenomena which take place in dental caries. We decided on the sheep as the animal which promised the greatest chances for success, because of the size of the incisors; the labial surface is more or less like that found in the human lower incisors, and because of the relative docility of the animal. The sheep was placed on a table and securely bound, the rubber-dam being applied over one or two incisors to prevent contact with saliva; the superior layers of the tooth were removed with a chisel, and with a wheel bur a cavity three mm. in depth by four mm. in width was prepared. The *débris* was removed with a current of hot air, and the most difficult and delicate part of the operation was begun. A very small drop of bouillon which had been inoculated twenty-four hours before was deposited in the bottom of the cavity. Over this a small, thin platinum cap was placed. This cap had been previously heated to redness, and in its concavity a small particle of gelatin, culture D, had been placed. A cement filling was made over the cap, and in order to avoid contamination with saliva, a drop of wax was melted over the cement so soon as it began to harden.

This experiment was made on the first right lateral incisor of a sheep possessing its full dentition. The microbic species used was that which we designated as No. I. During the nine months which the experiment lasted the animal did not seem to feel any discomfort while masticating. At the end of this time it was slaughtered, and the following phenomena were discovered: The cavity which had been made was found to be nearly oval in form. The dentin, instead of being white, as it normally is, was of a yellowish hue. It was

also softened. The softening, reaching a slight depth, was very plain, and a great deal more noticeable in the widest portion of the cavity, at the point where the diameter of the cavity had increased. A small particle of this softened dentin was carefully taken, and on inoculating the same kind of media as had been originally used we recognized the same species we had used for the original inoculation. The artificially decayed teeth were decalcified, and sections were made which showed that, although the softened zone was very small, the canaliculi had been invaded; the organisms could be found in the tubuli at a depth of two and one-half mm. The appearance of this section was not so typical as sections from teeth normally decayed. At twenty-five diameters the section presented the following appearance: The portion of the cavity which had not been attacked by microbe No. 1 was apparently normal. The coloring reagent, methyl-violet, was easily washed out. The borders were very plain, and seemed to have retained the appearance made with the wheel bur while drilling the cavity. The part of the cavity which had suffered from the action of the microbe seemed, on the contrary, to be entirely disorganized. We found in certain places small cavities like those found in normal decayed human teeth. At one hundred and fifty diameters the basis-substance appeared to have liquefied, and the tubuli appeared separated in transverse section. At eight hundred diameters it was possible to get a plainer view of the destruction of the basis-substance of the dentin, which was entirely corroded at the borders. On careful examination of the tubuli we found scattered here and there microbes of the kind used for the original inoculation. We wish to emphasize the fact that the microbes were found scattered at different points in the course of the tubuli, and not in masses, as in normal dentin. If the animal had not been slaughtered until a year later it seems probable that we should have found the same effects as in man, except that in the sheep we do not find the ramification of the tubuli near the enamel. Thus was demonstrated the possibility of producing artificial caries in a living animal.

We cannot repeat here all the experiments of the different investigators who have worked on the etiology of dental caries, so speak here only of the latest article on the subject by Mr. Kenneth Goadby. We do not agree with Mr. Goadby in the conclusions he draws from his researches. In his paper, entitled "The Microorganisms of Dental Caries," he speaks of the necessity of the unification of culture-media in order to conduct satisfactory researches, and also for the benefit of those who would desire to take up and verify them, who in that case could work on a similar basis. This proposition is a very just and rational one, especially when we know what modifications and transformations can occur in the morphology of a microbe, according to the medium in which it grows. Is it necessary

to recall in order of procedure the experiments made by Raullin when bacteriology was in its infancy—experiments made by means of the liquid which bears his name and in which a slight modification in the composition is sufficient to arrest or to transform the growth of a given species? Or is it necessary to recall the works of Gissard concerning the bacillus pyocyaneus, which he could at will cause to produce pyocyanin or fluorescence, according to the way he cultivated it, either in albumin or at a heat of thirty-seven degrees for five minutes?

Concerning the first experiments of Miller on the microbes of the oral cavity, it may be remarked that although we should consider that at that time bacteriology was in its infancy, nevertheless he occupied himself with the fermentation which these microbes could cause. He worked on their pathogeny by inoculating mice and rats, and as a consequence did not limit himself exclusively to the morphology.

Mr. Goadby thinks, and we agree with him, that in order to name a new microbe it must present such peculiarities in its biological, pathological, and biochemical properties that we should be able through those peculiarities to distinguish it from other species. The biochemical are, in our opinion, those properties which will greatly facilitate this distinction and identification. It is on this point that Mr. Goadby contradicts himself by leaving out the chemical questions; that is, the action of the microbes on carbohydrates and nitrogenous substances. In fact, we cannot admit that the only nitrogenous substances susceptible of being attacked by the bacillus necrodentalis, bacillus furvus, and bacillus plexiformis should be milk and peptone. There are probably other substances susceptible of undergoing fermentative changes which can be very active when under the influence of these organisms. For instance, glycerin, saccharin, lactose, dextrin, mannite, are some of the substances Mr. Goadby has not used in his experiments. We do not know if those microbes dissolve cooked albumin, if they cause fermentation of urea, if they convert nitrates into nitrites.

The author tells us that none of the microbes that he has studied have produced indol in the peptone solution, but this is not extraordinary when the reagent he has used to demonstrate the presence of indol is composed, as the author tells us in his previous article, of sulfuric or nitric acids, ignoring the potassium nitrate, which is not only useful, but absolutely indispensable to obtain the red current coloration peculiar to indol.

Mr. Goadby criticises the theory upheld in Dr. Williams' remarkable work, as to the decalcification of enamel through the rapid deposition of microorganisms over the surfaces of teeth; but to-day the chemico-parasitic theory is not only admitted, but also recognized as the only explanation. This theory is certainly rational.

It is true that the demonstration was not complete. Dr. Williams admits that he did not cultivate all the species in artificial media, but just the same the theory has all the chances of being recognized and accepted. Then Mr. Goadby finds fault with Dr. Williams for the omission among the organisms of one species which he and Mr. Washbourn have constantly found in three hundred mouths examined. They also found this organism in one hundred and fifty mouths in pure culture. We refer to the streptococcus designated by Mr. Goadby under the name of *Streptococcus brevis*. The frequency of the streptococci in the oral cavity (where it occurs in many different forms) was first pointed out by Netter in 1889. It may be that Mr. Goadby and Mr. Washbourn found the streptococcus first described by Marot, in which case they could have identified it by carrying the growth on a potato, where this microbe grows very well in contradistinction to the other species which do not grow on this medium; or by inoculating any animal, say the white mouse. If septicemia does not take place there is every reason to think that it is Marot's streptococcus. We do not admit, then, that Mr. Goadby should claim to have been the first to discover the presence in the mouth of the streptococcus, should it be the streptococcus *brevis* or any other.

In going carefully over Mr. Goadby's work we noticed that sometimes he goes out of the limits of the question (etiology of dental caries) to occupy himself with the microbes found in the saliva and over the teeth. This is, for instance, the case with the *leptothrix buccalis*. We find that among the anaërobic species Mr. Goadby has obtained and cultivated from the deep layers of carious dentin the *mesentericus* (*ruber*, *vulgatus*, *fuscus*). We cannot admit that those species are true anaërobic organisms. You may call them anaërobic facultatives if you please, but never purely anaërobic. The author probably found himself in the presence of some species which, while not the *mesentericus*, had some likeness to it.

Where we agree in every respect with Mr. Goadby, and where we find his superiority, is in his finding that the liquefying properties are so frequently possessed by the aërobic species taken from the surface of decayed dentin. These species liquefy gelatin and serum rapidly, and give a marked coloration to the nutritive media in which they have been cultivated, the phenomena depending entirely on the conditions present. We also think, as Mr. Goadby does, that the species obtained from the deeper layers produce one or more acids, but not so rapidly as he states, as the microbes which we have studied do not begin to acidify the liquid culture-medium before the fifth or sixth month, in any case, we wish to remark that the species Mr. Goadby speaks of are facultatively anaërobic.

Mr. Goadby accepts Miller's demonstrations that the first stage of dental caries consists in the disintegration of the calcium salts,

but we do not see the reason why, after criticising Miller for having worked with impure cultures, he did not carry his experiments of confirmation on the same basis; that is, on undecalcified sections. In fact, having at his disposal pure culture of his *Bacillus furvus* and his *Bacillus plexiformis*, we think it would have been to his advantage to have used sections of dried teeth rather than decalcified sections. We have made comparative experiments with certain common microbes, such as the *Micrococcus roseus* and *Bacillus megatherium*, and we have been able to see clearly that undecalcified sections of teeth placed in tubes of peptonized gelatin were after a certain time completely corroded by contact with those species. As a consequence we think that it would have been preferable for Mr. Goadby to have those microbes act on undecalcified sections in order to see if they had any digestive action either on albumin or on starch paste. We cannot advance anything in regard to the property said to be possessed by some species, of having a liquefactive action on gelatin and no action whatsoever on dentin; but on the contrary, we can affirm that certain species (No. 1 at least) do not liquefy gelatin but dissolve dentin.

With regard to the *Bacillus necrodentalis* which Mr. Goadby has so often found in pure cultures in the deep layers of dentin, and to which he seems to attribute some prominent part in the process of dentin destruction, it is regrettable that its action should not have been tried on carbohydrates and nitrogenous substances. Mr. Goadby tells us that he did not observe the presence of gases, but he forgets to state in what medium; and we think, judging from the changes that milk undergoes, that it would have been very interesting to see the fermentative action of this microbe on lactose or some other similar body. In concluding, he says and maintains that in dental caries: 1. The liquefying organisms are in the majority of cases aerobic. 2. The majority of microorganisms found in the deep layers of dentin are producers of acids. 3. It does not follow that because gelatin is liquefied dentin will be digested (dissolved.)

Nutritive Media.—The nutritive media that we have used in our experiments are: 1. Peptonized bouillon, peptonized gelatin, peptonized gelose, 1 per cent. 2. Bouillon glycerophosphate of calcium, gelatin glycerophosphate of calcium, gelose glycerophosphate of calcium, at 1 per cent. 3. Special bouillon, special gelatin, special gelose. 4. Tooth gelatin. 5. Potato. 6. Milk. 7. Starch. 8. Carbohydrates. 9. Nitrogenous substances. Being absolutely convinced of the necessity of unification in culture-media, and to avoid criticisms such as we have just made upon Mr. Goadby, we give not only the composition of the nutritive materials we have used, but also and especially their preparation. Our bouillon is always prepared by macerating for four hours 500 grams of beef in one liter of distilled water at ordinary temperature. It is then

filtered through a wet filter paper and boiled for five minutes. One per cent of peptone is added. The liquid is then neutralized and put in the autoclave and left there for ten minutes at 115° C., filtered and put in test tubes. Salt is never added to the bouillon of whatever formula. This is the formula of ordinary bouillon, or bouillon A. The bouillon glycerophosphate of calcium has the same composition as the preceding, with the addition of one per cent of glycerophosphate of calcium. The formula is then: Bouillon, 500 grams; peptone, 5 grams; glycerophosphate, 5 grams. Special bouillon has the following formula, which approaches as much as possible the chemical composition of the human tooth: Bouillon, 500 grams; peptone, 5 grams; phosphate of calcium, 50 grams; carbonate of calcium, 10 grams; phosphate of magnesia, 5 grams. After mixing all these substances, the liquid is sterilized, filtered to such a degree that the liquid should have a lemon yellow color, and should not present any trace of the substances used. The nutritive media, like gelose and gelatin, are incorporated with the bouillon in the proportion of twelve per cent and seven per cent.

There is another solid special nutritive medium which approaches as much as possible the chemical composition of dentin, and which is prepared in the following way: To 125 grams of simple bouillon, without peptone and neutralized, are added 31 grams of a very fine powder obtained by filing a hippopotamus tooth. The liquid is sterilized in the autoclave at 115° or 120° C. for fifteen minutes, and without being filtered is put into test tubes, which are then sterilized at the same temperature. For inoculation in striæ the tubes are placed in an inclined position. In other cases they are to have an upright position. After cooling, a good transparent gelatin is obtained. It dissolves at about 19° or 20° C., and presents at the bottom a white layer, which is the result of the settling of the dentin. The other media used are—nitrogenous substances; peptone, cooked albumin, milk, urea, nitrates, starch. Carbohydrates: glycerin, mannite, dulcitol, glucose, saccharose, maltose, arabinose, lactose, dextrin, inulin. For the composition of these substances the reader is referred to the extensive work of M. Grimbert on the unification of culture-media in bacteriology. We will add that when working on urea we put a little chalk in the bottom of the tubes. We insist upon the use of those special media which we have obtained after many experiments, and whose formulæ have already been given. These media have given us the best results in regard to the development of the species studied. The media that we particularly prefer are the gelatin, D, B, and G.

Concerning the Non-specificity of the Microbes of Dental Caries.—It would have been possible for us at one time to have supported the theory of the specificity of certain microbes in the production of dental caries, but as we proceeded in the study of this

question and in cultivating the different species obtained from the superficial and deeper layers of dentin, we became more and more convinced not only that there was no specific microbe, but that its existence was an impossibility. In fact, according to the chemico-parasitic theory, this affection presents two absolutely defined and distinct stages: (1) Decalcification of the hard external portions of the tooth, as a consequence of the secretions of certain microorganisms yet to be determined, although Williams has done a great deal toward the illumination of this question; (2) penetration of the living tissues by these organisms, producers of acids, or by some other kind, and their subsequent growth in those tissues—a growth which must go on with ease, judging from the histological structure of the tooth; that is, the dentin, dentinal tubuli, dentinal fibers, and interglobular spaces, or spaces of Czermarck.

According to the definition given by Dr. Frey, caries is an affection which proceeds from without inward. In our opinion, once decalcification has taken place the remainder of the work is performed by other organisms from those first concerned; these give up their places to an immensity of other species of relatively very small volume, which can penetrate with ease into the basis-substance or dentin which has been slightly decalcified, or into the dentinal tubuli, which, as we know, are smaller and greatly ramified in the vicinity of the enamel. To make it appear, as we see in many works on dental pathology, that the leptothrix threads penetrate the dentinal canaliculi is absolutely irrational, and such a statement could be made only by one who had never made any microscopical study, or at least had not compared the caliber of a dentinal tubule near the enamel with the diameter of any leptothrix.

Dental caries, when the disease is localized in the dentin, is of polymicrobial origin. There is no specific microbe; the existence of one could not be possible. All the species obtained from the superficial and deep layers of softened dentin, and even from the dentinal tubuli, away from the softened zone—all these species are, we will not say common (the inoculation of certain microbes which we have found having proved their pathogeny), but they all originate from the oral cavity.

We are among the first to recognize that it is impossible to isolate a microbe by microscopical examination alone; nevertheless, without expecting to identify them, we can with the microscope make the distinction between a micrococcus and a bacillus or a thread. So, if we examine a section of decayed dentin, even with low powers, we shall never find just one species of micrococcus or bacillus, but always microbial associations. Sometimes the cocci will be in greater numbers, sometimes the bacilli, according to the portion of dentin examined, whether from nearer the surface or from deep in the structure of the tubuli. Some species may preponderate, and we

must consider the microbic antagonism which must exist in the tooth, just as on the body, which makes the preponderance of either the cocci or the bacilli.

It may be justly remarked that the penetration of the microbes into the tubuli proves their anaërobic properties. To this we reply that a great majority of the microbic species found in the mouth are not true aërobic, but facultative aërobic. In fact, the number of pure anaërobic species is absolutely small, so that we cannot admit the specificity of a certain microbe. If certain species are found more frequently than others in carious dentin, and especially in the depths of the tubuli, it must be due primarily to microbic antagonism existing between the great number of species which have gained entrance into the canaliculi, and also especially to the surroundings of a new field of culture. The true aërobic species and the facultative anaërobic which were mixed up at the opening of the tooth became gradually accustomed in the canaliculi to their new habitat. The anaërobic facultative species had their anaërobic properties developed, and the aërobic had either to stop in their destructive course toward the pulp or had to get gradually accustomed to the absence of oxygen. This explains the great decrease of microbes in the deeper portions of the tubuli, where we find only a few species, as has been proved by the experiments of Galippe and Vignal, Miller, Goadby, and our own.

We are convinced that these microorganisms have no specificity such as we find in anthrax, cholera, tetanus, or the plague. They originate in the saliva, and in the course of time it will be possible to identify them by means of cultures and growths in laboratories.

Study of Five Microbic Species Found Under Fillings.—The species which we have specially studied among those we obtained from the deeper layers of dentin in contact with good fillings, and which were derived from the three cases referred to in the preceding pages, are the following: *Species No. I.*—*Bacillus*, facultative, aërobic, with marked tendencies to grow better in vacuum than in the air. The temperature of the incubator seems to favor rapid development in bouillon. The favorable culture-media are very few, as this species does not grow in gelose of any composition or on potato. This bacillus presents, as we will see, extraordinary peculiarities. Thus, if the growth is carried on in bouillon inoculated with a very small particle of culture taken from gelatin, the development is very rapid; but if we inoculate a culture from a growth in bouillon the development is slow and sometimes never takes place. In the same way, in order to inoculate tubes of gelatin we must use particles from growth in bouillon, otherwise no result is obtained. This species possess the very extraordinary property of changing their form. Thus if inoculated in gelatin they present the bacillus form; if inoculated in bouillon they are entirely

transformed. Under the microscope we see them changed into ramifying bodies with rounded and swollen extremities. If a drop of bouillon is transferred to the gelatin the primitive form reappears.

Bouillons.—Of the three classes of bouillon that we have used, the growth went on with greatest rapidity in bouillon C. In general the growth requires four hours in tubes stopped with cotton, and two hours and a half in vacuum tubes. The growth has the form of a small, well-defined cloud of a silky appearance, localized in the upper portion of the tube. After ten days this cloud diminishes in an imperceptible way, the bouillon clarifies, and there is found at the bottom of the tube a finely granular deposit. Bouillon B comes next in rapidity of growth. This bouillon becomes clouded at about the fifth hour, just as well in the air as in the vacuum. A few bubbles of gas are produced, and this kind of fermentation lasts about forty-eight hours. About the tenth day the upper third of the liquid becomes cleared off, while the remainder continues to be cloudy. Bouillon A takes still longer for the cloudiness to appear—from seven to eight hours. These different kinds of bouillon, all of feeble alkaline reaction before inoculation, become acid at the sixth month. If the examination is made with a hanging drop preparation, a marked rotary movement is observed. About the fifth or sixth day all movements disappear.

Gelatin.—Rapidity of growth, B, D, C, A. This species when inoculated in Pétri dishes, prepared in the ordinary way, that is, by inoculating a tube of liquefied gelatin with a particle of culture in bouillon, begins to grow at about the fifth or sixth day. The colonies are of oval form and yellowish color, and become round and white, with a metallic luster as they come nearer to the surface of the gelatin. It should be remarked that this species required at the commencement of the experiments two months in order to obtain the same result. These colonies are not *liquefacients*. They possess the peculiar property of producing at about the twentieth day a cloudiness all through the gelatin, and to retard and even to prevent any fungus growth, which could be produced by the deposition of fungi on the surface of the gelatin.

Stab Culture.—The line of inoculation is granulated. The whole presents the appearance of a nail with a well defined head, especially in gelatin culture (C). In this medium there is formed at the superior portion a distinct cloudy and dense circle. The color of the colony becomes in the course of time (one year) grayish, and presents a metallic luster on gelatin D. The head of the nail is less defined, and the color, which was grayish, becomes transparent pearl-white. There is no cloudiness through the thickness of the medium. In gelatin B the head of the nail is less defined than in D, but as compensation there is a very thick cloudiness. In cultures one or two years old on this medium the cloudiness becomes brown-

ish at the center, corresponding with the point of inoculation, and it is sometimes very hard to go through it with the platinum wire. On gelatin A no nail is formed. The growth takes place in the bottom, and without the formation of any cloudiness.

Smear Culture by Means of a Pipet.—Gelatin A colonies develop very slowly. It takes them two months to make their appearance. They are thick, adhere to the gelatin, and are of a porcelain white. Cloudiness appears about the second month after the first appearance of the culture. Gelatin B—Growth very rapid; begin to develop after forty-eight hours. Colonies look creamy, but in reality are dry, and are easily separated from the surface of the gelatin, to which they scarcely adhere. Gelatin C—Same phenomena. Gelatin D—Appearance is greasy and thick. At the beginning is nearly invisible, becoming yellowish in the course of time.

Although glycerin is not considered among the group of nutritive materials used in bacteriology, we have made a trial on gelatin pepto-glycerized at one per cent. It was a long time before the colonies appeared—eight months. At the beginning the color was the same as in gelatin D, but after three years the point of inoculation became entirely black. The odor of this tube, especially after a time, is something like that of carious dentin. In this case the culture developed in a splendid way, and had a thick and creamy appearance.

Serum—no growth. Gelose—no growth, inoculation from the deep portion of a culture on gelatin did not give any result. The same with inoculation from bouillon. Potato—no growth. *Action on Nitrogenous Substances.*—Peptone—grows without the production of indol. Albumin—grows, but does not dissolve it. Milk—grows without changing it. Urea—grows without marked fermentation. Nitrates—no growth. *Action on Carbohydrates.*—Glycerin—grows, slight fermentation. Mannite—grows, slight fermentation. Dulcitol—no fermentation. Erythritol, Arabinose—no fermentation. Glucose, Galactose—slight fermentation. Saccharose, —very active fermentation. Lactose, Maltose, Dextrin—slight fermentation. Inulin—marked fermentation after forty-eight hours. The liquid, when heated with Fehling's solution, gives after cooling a brownish-green color, while another tube under the same conditions gives an orange color. Starch paste—no growth. Pathogenesis—none.

Species No. II.—Micrococcus, very small, facultative aërobic, growing better in the absence than in the presence of air. Grows very slowly on gelatin, and if the Pétri dishes are used the colonies do not appear before the fifteenth or twentieth day. The gelatin is not liquefied, but becomes soft, especially in stab cultures. Particular characteristics, alkaline reaction of the bouillon after six months, and formation in the gelatin after a year of big crystals

that we have as yet not determined. These crystals sink to the bottom of the tube after going through all the thickness of the gelatin. Grows better at incubator temperature than at ordinary temperature. Gelose is a bad medium for the development of this species. This species stains well with the ordinary staining reagents. Bouillons A, B, C—Rapidity of growth B, C, A. Bouillon B—The cloudiness appears after four hours; it has a silky appearance. The liquid becomes clear after ten or twelve days, and a finely granular deposit appears in the bottom of the tubes. Bouillon C—Same phenomena, except that it takes longer for the liquid to clear. Bouillon A—Same phenomena. Trials were made on bouillon pepto-glycerized, and after inoculation a small fermentation took place. Examination with the hanging-drop preparation reveals a marked rotary movement for six to seven hours.

Gelatin.—Rapidity of growth B, C, D, A. This species grows very slowly in this medium. At the beginning the time required for this species to develop in this medium was one month; to-day it is three. The gelatin is not liquefied, but becomes semi-soft. The color of the colonies in the Pétri dish is first white, but as the colonies appear and develop near the surface they become greenish-white, round, with a depressed center.

Slab Culture.—Course of inoculation is granulated. The upper portion of the gelatin at the point of inoculation looks something like a nail. This corresponds to what later will become the dark portion of the colony. The colony grows larger and sinks to the bottom of the tube in a V-shape form. The borders are greenish-white, and slightly indented. The central portion is dark. All around the colony and at the superior portion of the gelatin a cloud is formed something similar to the one observed in No. 1. The crystals above referred to do not appear before a year. These phenomena are the same for the different kinds of gelatin, except that the clouds and crystals are only found in the peptonized gelatins.

Smear Culture.—Growth very slow. The inoculation should be made by means of a platinum wire or a pipet. The appearance of the colonies is the same except for gelatin D, where they all look transparent.

Serum.—Slight greenish-white appearance, culture very small. *Gelose.*—Growth very slow in occurring. I, on Gelose B. After fifteen days the colony appears like an accumulation of small spinning points. II, on Gelose C. As a general rule after twenty days. No result on ordinary gelose. *Potato.*—Small whitish appearance after fifteen days. These delays in development are a little lessened when the cultures are carried on in the absence of air. *Action on Nitrogenous Substances.*—Peptone—grows, no formation of indol. Albumin—grows without dissolving it. Milk—no change is produced. Urea—grows, slight fermentation during four hours.

Nitrates—no growth. *Action on Carbohydrates.*—Glycerin—slight fermentation. Mannite—no fermentation. Dulcite—marked fermentation. Erythrite—same phenomena produced. Arabinose—imperceptible fermentation. Glucose, Galactose—no fermentation. Saccharose—no fermentation. Maltose—marked fermentation. Lactose, Dextrin, Inulin—no change. Starch paste—grows without dissolving it. Pathogenesis—produces when inoculated in small quantities in the white mouse and in the guinea pig abscesses of great size. General infection does not take place.

We wish to emphasize that this species, as well as No. III and IV, although it may seem extraordinary, cause a fermentation in urea. We must also say that fermentation takes place only in those tubes in which a small quantity of carbonate of calcium has been previously placed.

Species No. III.—Diplococcus, anaërobic facultative; grows better in the absence than in the presence of oxygen, and with greater rapidity at incubator temperature than at ordinary temperature. Stains well with Gram's method and with Ziehl's carbolized fuchsin. With this preparation it is sometimes possible to detect a capsule which appears more plainly when examination is carried on in a hanging-drop preparation.

Bouillons.—This species develops just as rapidly in any of the three kinds of bouillons that we have used (A, B, C). Cloudiness appears after four hours, just the same if the inoculation is made from a liquid medium or from gelatin. In the vacuum the cloudiness begins more rapidly, and is complete after two hours. Bouillon A—Silky cloudiness in all the liquid. This begins to clarify at about the fifteenth day, and a gray filamentous precipitate is deposited in the bottom of the tube. Bouillon B—Same cloudiness; fermentation lasts five to six hours. The upper part of the tube becomes perfectly clear at about the second month. No muco-filamentous precipitate is observed. Bouillon C—A uniform cloudiness is present. A muco-filamentous and thick deposit is observed in the bottom of the tube. These three bouillons become of an acid reaction at about the third month. If the species is examined with the hanging drop a very plain capsule is observed, and also a vibratory movement, which disappears after five or six hours.

Gelatin.—As we proceed in the culture of this species the development takes place with less rapidity, and the biological and pathogenic properties seem to have undergone marked modifications. Originally the culture of colonies carried on in Pétri dishes of gelatin developed in forty-eight hours. To-day it takes eight days before they begin to appear. They have the appearance of white points, which become of a porcelain white as they approach the surface. They are uniformly round, and of button shape.

Slab Culture.—Fine granular appearance all along the course of

inoculation. This begins to become visible at about the tenth day. Growth is as rapid in the presence as in the absence of oxygen. There is a difference in the appearance of the culture, according to the presence or absence of oxygen. In the air colonies are of a porcelain white; do not have the nail form, but spread over the surface of the gelatin. Appearance after two months of a cloud just beneath the point of inoculation. In the vacuum colonies are colorless, but of the same form, and have no cloud. Gelatin B—(1) In the air the borders of the colonies are folded; they are of a grayish white; the central portion of a yellowish white. Cloudiness all over the gelatin. (2) In the vacuum central portion is yellowish; peripheral portion is transparent; presence of a cloud. Gelatin C—(1) In the air same appearance as A, with the difference that the cloud is very slight and appears a little later, at about the fourth month. (2) In the vacuum uniform white porcelain spot, with borders cut out like clubs.

Smear Culture.—A colonies are of a creamy-white appearance; develop in the air at about the fifteenth day, and in the vacuum from the eighth to the ninth day. No cloudiness appears in the gelatin in the air or vacuum. B colonies are greenish-white lengthwise; thick clouds appear in the presence or absence of oxygen. C, same phenomena as with stab culture. D, thick, creamy, transparent spot; cloud in the upper portion. Serum—Delicate spot. Brilliant white color appears after six hours in incubator. Potato—No appearance of growth. Gelose A, B, C—Rapid growth; very plain after three hours. Colonies white and rounded.

Action on Nitrogenous Substances.—Peptone, Albumin and Milk—no action. Urea—very active fermentation. Nitrates—grow, but without transforming them into nitrites. *Action on Carbohydrates.*—Glycerin—growth, slight fermentation. Mannite, Dulcitate—very slight fermentation. Erythrite, Arabinose—active fermentation. Glucose, Galactose—very slight fermentation. Saccharose—very active fermentation. Lactose, Maltose—fermentation. Dextrin, Inulin—slight fermentation. Starch paste—no action. Pathogenesis—Originally an inoculation in the leg of a white mouse of half a cubic centimeter proved fatal. At the autopsy this species was found in pure culture in the blood in the form of capsulated diplococci. This primitive virulence has become very attenuated, as the inoculation of the same species produces to-day only a bad but transient indisposition.

Species No. IV.—Cocci grouped in pairs, chaplets, or grapes. Aërobic facultative, with tendency to grow better at the temperature of the incubator (36° to 37°). In media kept in the air and at ordinary temperature the colonies grow with difficulty. They have a capsule which is difficult to observe under the microscope. They stain with all the reagents commonly used, the Gram method

included. Peculiar phenomenon. Liquefaction begins now, after five years of culture, at about the fourth month, and progresses rapidly, while originally it did not begin before the eighth month. There is no cloudiness produced in the gelatin.

Bouillons.—Bouillons A, B, C inoculated with liquid culture, or with a particle of a colony from gelatin, become generally clouded after two hours. At the upper part of the liquid a dusty cloud is observed. Bouillon B ferments actively, and presents after ten days, if the growth has taken place in the vacuum, a thick and marked creamy cloudiness. It should be noticed that growth goes on with greater rapidity in the absence of air. When the growth is carried on in the presence of air a pellicle is formed on the surface of the liquid. After eight days the cloudiness has extended over the entire contents of the tube. In time it becomes clear, and presents a white filamentous precipitate, less marked than in No. III. When this species is examined in a hanging-drop preparation we observe a marked oscillating movement. The cocci may be grouped in pairs, grapes, or chaplets; they are very frequently found in the chaplet arrangement. The reaction of the liquid becomes acid at the fifth month.

Gelatin—Stab Culture.—Growth did not appear before the third month; had the form of a delicate and white semi-granular spot. The appearance is something like that of No. III, although less white. The liquefaction begins at about the fourth month. The gelatin while liquefying does not have the form of a funnel, as it generally does with other species. The gelatin shows no cloudiness, and is kept clear even after total liquefaction. In striæ the colonies take the same time to appear. They come in the form of small round and white colonies, which cause the gelatin to bulge out before liquefaction takes place.

Gelose—This is the best solid medium for the culture of this species. On gelose A the growth begins after four days, while on gelose B, and especially on gelose C, a trace of growth is apparent after two hours. This trace is of a whitish blue, and the colonies are round. Serum—a small white spot after six hours. Potato—nothing.

Action on Nitrogenous Substances.—Peptone—grow without the production of indol. Albumin—grow without dissolving it. Milk—grow well; milk transformed into a yellow liquid of disagreeable odor. Urea—grow very well and cause active fermentation. This property so well developed at the beginning tends now to disappear. Nitrates—grow and transform them into nitrites by means of Griess' reagent. *Action on Carbohydrates.*—Glycerin—slight fermentation. Mannite—active fermentation. Erythrite—marked fermentation. Arabinose, Glucose—grow without fermentation. Galactose, Maltose—imperceptible fermentation. Saccharose, Lactose

—no growth. Dextrin, Inulin—slight fermentation. Starch paste—no growth. Pathogenesis—kills mice in twenty-four hours, and is found in pure culture in the heart and lungs.

Species No. V—*Bacillus*, with a marked tendency to grow better in the absence of oxygen. Just as species Nos. III and IV, this species prefers the temperature of the incubator to the ordinary temperature. It stains well with the ordinary staining reagents; also with the Gram method.

Bouillon A—A uniform cloudiness sets in after twelve hours; a sticky deposit is formed after two or three months. **Bouillon B** becomes clouded in the same time; presents a cloud in the upper, fermenting part of the liquid, and never clears. **Bouillon C**—Same phenomena as with A, with the difference that the deposit is a great deal more sticky and compact. When a hanging-drop preparation is examined the bacilli are seen grouped in pairs or chaplets; slight rotary movement.

Gelatin.—If the growth is carried on in Pétri dishes the colonies have an oval form and a yellowish color, and begin to appear after forty-eight hours in all new cultures. The appearance of these colonies is now greatly delayed. It takes fifteen days before they begin to appear. These colonies are not liqueficients. At full growth these colonies have a round form, with white, irregular borders, while the central portion, which is the most elevated, is dark yellow. No cloudiness is present.

Slab Culture.—Rapidity of growth B, D, C, A. The course of the inoculation is uniform, and has the appearance of a nail without a head. No cloudiness takes place. The colonies begin to appear at about the fifteenth day. They present the same peculiarities as when growth is carried in on Pétri dishes.

Gelose—Rapidity of culture C, B, A. On gelose C after six hours it is possible to distinguish a growth which reflects rays of brilliant rainbow colors. After twenty-four hours the growth becomes thick and granular, and the refraction disappears. On gelose B the phenomena are the same, except that the colonies are thicker and larger. On gelose A—no growth is produced. On serum—a slight growth of fish-scale appearance (after forty-eight hours.) Potato—no growth.

Action on Carbohydrates.—Glycerin, Erythrite, Arabinose—no growth. Mannite, Glucose, Inulin—imperceptible fermentation. Maltose—no growth. **Action on Nitrogenous Substances**.—No fermentative action; growth takes place nevertheless on these media, except on starch paste.

Conclusions.—We can see from the characteristic properties that we have noted that the species that we have studied have never before been described. To consider them specific microbes would be contrary to our ideas. We only wished to describe them, reserv-

ing the right to study them again until we should be able to identify them with some other species that are found in the oral cavity, and as conclusion we will say that: 1. There is not, properly speaking, a specific microbe of dental caries. The species that are found in the deeper layers of the dentin are merely ordinary species, more or less pathogenic it is true, but all have their origin in the oral cavity. 2. These species are less frequent in the deeper portions of the tubuli, because of a microbic antagonism or of their facultative anaërobic property. 3. The destructive process of caries may take place under good fillings of whatever material after the lapse of a long time. 4. The experimental reproduction of caries on a living animal is to-day a demonstrated fact. It was produced with a microbic species taken from under a good filling seven years old. 5. It is possible that there are certain microorganisms which will dissolve healthy dentin without themselves being liquefying agents of gelatin and serum.—*Cosmos*.

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MATRIX FOR PORCELAIN INLAY WORK. By Dr. H. J. Bosart, Springfield, O. The foundation of perfection in inlay work is obtaining a perfectly fitting matrix of the cavity and retaining its exact shape until the process of investing and baking is finished. Every worker also recognizes the need of a more certain method for obtaining a perfect matrix than at present exists, so I will present the following, which has been a success in my hands.

If an approximal cavity, the teeth should be separated to give plenty of space for the manipulation of matrix as well as for insertion of finished inlay. Better results are possible throughout the work if the dam is used; but the color of tooth should be selected before placing the dam. First prepare the cavity for the making of matrix by trimming the edges to the necessary extent, leaving them perfectly square, sharp and smooth, avoiding undercuts where they would prevent easy access, which can often be done by leaving some of the more solid decay; if this is not practicable, fill under the overhanging enamel with cement. When hard, shape cavity, giving it parallel sides, thus making the removal of a perfect matrix easy, whereas it would be impossible if undercuts existed.

After matrix is completed remove the remaining decay, and undercut cavity to retain finished inlay. No. 30 gold foil or a combination foil of platinum and gold makes the best matrix, as it is softer than platinum, being more easily moulded to the irregularities of the cavity; this method for removing from cavity and hand-

ling stiffens the matrix and renders impossible a change of shape, no matter how large or complicated the cavity.

Select piece of foil of sufficient size. With a pellet of cotton work well over bottom of cavity; hold and work from there out to edges until foil is perfectly fitted to cavity; then bring foil out over tooth and hold with fingers or stick to tooth with Canada balsam dissolved in chloroform. As the case would indicate, place in the cavity of the matrix—to facilitate removal and handling—either the point of a broach with a slight bend forming a hook, or a bit of floss silk with a knot at the end.

Now fill the matrix with Hill's temporary stopping, using as much care as in putting in a gutta-percha filling. The more care used in placing filling the more perfectly the matrix will be conformed to the shape of cavity. This filling hardening makes an unyielding support to the matrix, precluding the possibility of a change in shape during the process of removal from cavity and investing of matrix. By the aid of the previously inserted broach or floss silk filling and matrix are easily removed and invested.

Mix the investment plaster with water to the desired consistency and place in the baking tray sufficient to imbed the matrix, slightly tapping the tray to settle the matrix in investment, allowing it to cover the free edges but not quite reach the cavity line. To insure expulsion of air bubbles carefully coat the reverse side of matrix with the mixed investment plaster before imbedding. When investment is hard warm sufficiently to soften the temporary stopping, which can then nearly all be removed by the broach or floss silk. What remains wash from matrix with chloroform, which will not soften nor affect investment. Fill cleansed matrix with the selected enamel and bake in the usual manner, with the assurance that the finished inlay will be a perfect fit.—*Summary, Jan., 1902.*

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BACTERIA; THEIR THERMAL DEATH-POINTS. Different species of bacteria vary greatly in their powers of resisting the action of heat. Speaking generally, pathogenic microorganisms perish at a much lower temperature than nonpathogenic bacteria. Thus the well known *B. prodigiosus*, which forms a beautiful blood-red colony when grown on moist bread, cannot withstand a temperature of 58° C. for more than ten minutes, whereas the tetanus bacillus perishes only after six hours at 80° C. The bacillus

of tuberculosis is rapidly destroyed in cultivations at 70° to 80° C.; but according to Welch, it can resist in the dry state a temperature of 100° C. for three hours. In milk it has been found to perish after four hours at 55° C.; one hour, 60° C.; five minutes, at 80° C.; and one minute at 95° C. (Forster). The spores of bacteria can withstand far higher temperatures than the bacteria themselves. Thus the spores of the tetanus and anthrax bacilli are both extremely resistant to heat, though the latter are destroyed by moist heat at 90° to 95° C. This fact is recognized in the sterilization of food products, which are first heated to a sufficient temperature to destroy the parent bacteria, then left for the spores to develop, and again heated to kill the newly-formed bacteria. As regards the action of heat upon the toxic products of different bacteria, it has been found that some, like the toxin of tetanus, are decomposed and rendered harmless after a short exposure to a low temperature; while others, like the toxin of anthrax, are only weakened and not destroyed at temperature of boiling water.—*Am. Microscopic Jour.*

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PYORRHEA ALVEOLARIS WITH SPECIAL REFERENCE TO PRACTICAL MEDICINE. By Wm. Baldwin Keyes, D.D.S., London, Eng. I need make no apology for taking this well-worn subject as the text for my paper, since the medical profession as a body is just commencing to realize its immense importance in the production of various morbid conditions.

Among dentists much has been written upon the etiology, pathology, and treatment of this very common affection, but mostly from a prosthetic point of view; and its cure has been considered advisable more with a view of preserving the patient's teeth and adding to his personal comfort than with the idea of curing or preserving him from some very serious maladies. On looking through a series of volumes of any of the leading dental journals one is struck by the amount which has been written upon the subject, and by the speculations as to its probable cause. Of late years the tendency has been to assume a rheumatic or gouty basis for its production, and several very able men have carried out elaborate investigations, with more or less success, with the hope of obtaining material proof of this hypothesis. The deposits upon teeth have been analyzed, and one observer has claimed to have found that they contained uric acid, only to be contradicted by other equally capable workers.

But the tendency of most modern thought is to show that we may have been putting the cart before the horse, and that instead of gout and rheumatism being the cause of pyorrhea, they are often the effect; and that the general systemic affection is the direct result of the chronic poisoning of the tissues of the patient by the toxins of pus produced by the disease in the mouth.

A most valuable work upon the subject has been recently published by Dr. William Hunter, ("Oral Sepsis as a Cause of Septic Gastritis, Toxic Neuritis, and Other Septic Conditions,") and I have drawn upon it for some of the statements in this paper.

Dr. Herschell, one of the leading specialists in London upon disease of the digestive organs, has for some years also been conducting a very elaborate investigation of the relation of pyorrhea alveolaris to affections of the stomach and heart. In the first edition of his book on "Indigestion," published in 1894, he drew attention to pyorrhea as a cause of certain gastric troubles, and since that time has examined some hundred cases of functional disturbances of the heart and stomach with especial reference to the condition of the gums and teeth.

As regards the production and appearance of pyorrhea, it is for my present purposes unnecessary to go into a detailed description, as these are generally well understood. I will therefore merely state a few propositions which I think are incapable of refutation.

1. The pus from diseased bone is the worst and most virulent kind of pus, as used to be well illustrated by the fearful cases of pyemia met with in operations upon necrosed bones before the advent of aseptic surgery.
2. Therefore the pus from and in connection with diseased teeth may be expected to possess the same characteristics. Teeth are not true bones, but their roots have a distinctly bony covering which, with the alveolar walls surrounding them, will, when in a state of decay and slow decomposition, produce septic conditions such as are found in wounds in any part of the body where pieces of bone are decayed or necrosed.
3. The gastric juice is capable of destroying a certain proportion of the disease germs introduced into it, but not all.
4. During a large proportion of the twenty-four hours a healthy stomach contains no gastric juice.
5. The resistance of the human body to toxins introduced from without, varies in different individuals, and *ceteris paribus* will be diminished by poor general health, defective hygiene, or exhaustion

of mind or body. We can thus easily understand how disease germs introduced into the stomach will sometimes set up toxic symptoms and sometimes be tolerated by the individual.

According to Hunter (*op. cit.* p. 5), the most important organisms met with in the septic mouth are the bacillus gangrenæ pulpæ, the staphylococcus pyogenes aureus, streptococcus pyogenes, staphylococcus pyogenes albus, bacillus pyocyaneus, and the staphylococcus pyogenes citreus. The numerous organisms enumerated by Miller, Fitzgerald, and others appear to possess little practical significance.

The injurious effects of the constant swallowing of pus may be enumerated as follows: A. The effect upon the food in the stomach, producing abnormal fermentation, and the local effects upon the walls of the stomach. B. The systemic effects produced by the absorption of toxins in the system. (A) *Local Effects upon the Stomach.* The following are six typical cases selected from Dr. Herschell's clinic and communicated by him for insertion in this paper: *Case 1. Gastric neurasthenia, hyperesthesia of gastric nerves, hyperchlorhydria.* Louisa F., aged thirty, seamstress, attended the hospital on June 3, 1896. Her present illness commenced twelve months previously, and her chief complaints were of epigastric pain a few minutes after taking food, with a great aggravation about two hours later. This later pain was very severe, and often caused her to roll upon the floor in agony. She described it as cramps. It was relieved by taking food, especially milk. She was also troubled with constipation and palpitation of the heart. Upon making a physical examination of the stomach, splash (*clapotage*) could be obtained two inches below the level of the umbilicus. As the pain happened to be present at the time of examination, a dose of eight grams of sodium bicarbonate was given, with the result of immediately relieving it. On the examination of the stomach contents three hours after a test meal, consisting of meat, bread, and water, the total acidity was found to be 100, free HCl 86, with marked presence of erythrodextrin. There could therefore be no doubt of the presence of hyperchlorhydria, the pain immediately after taking food being probably due to gastric hyperesthesia. On examination the mouth was found to be in a bad condition; pyorrhea was seen to exist, the discharge of pus being very profuse. Treatment was conducted upon ordinary lines until July 2

without any marked benefit, when she was sent to the dental hospital to have the mouth treated. When this had been done, treatment of the gastric neurasthenia was resumed with the happiest results, the patient being practically well at the end of August, with a total acidity of 40 and only the normal amount of free HCl.

Case 2. Myasthenia, or muscular atony of the stomach. The patient, Annie H., a nurse, aged forty-one, presented herself on September 20, 1889. She complained of weakness and palpitation of the heart, vertigo on movement, and had been steadily getting thinner for some time. During the digestive period she was troubled with considerable flatulence. Upon examination the stomach was found to extend two inches below the umbilicus, and contained food residues from the day before. By the water test it was demonstrated that this retention was due to myasthenia, and not to pyloric obstruction. A Turck's capsule demonstrated the absence of any free acid in the stomach. The mouth was filled with black and decaying stumps, and was in a fearfully septic condition. The mouth was treated, and the patient given a simple mixture containing iron and strychnin. By November 28 she was practically well. The gastric splashing was, of course, still to be obtained, although not through the whole of the digestive period, but the patient had a good appetite and was putting on flesh.

Case 3. Gastric myasthenia of the third degree, with retention of food residue. Catherine C., aged thirty, married, came under observation on November 3, 1899. She had been weakly for some years, and had suffered from frequent attacks of syncope. Had a severe confinement six years ago. Takes a good deal of weak tea, bread and potatoes. Complains now chiefly of flatulence, which keeps her awake during the early part of the night. Gastric splashing was to be obtained below the umbilicus, and from an examination of the material—vomited before breakfast—which the patient brought with her, it appeared that the stomach contained food residues of the day before. A microscopic examination of the vomit also showed the Oppler-Boas bacillus and sarcinæ. There was profuse pyorrhea. By appropriate treatment the case was brought back to the stagnation stage, and no food residues were to be obtained before breakfast.

Case 3. Neurasthenia.—Florence C., aged twenty-four, music mistress, came under observation on May 10, 1897. She complained

of emaciation, nervousness, tenderness of the scalp, weakness of the back, claustrophobia, and other morbid fears. Was afraid to go out alone. She had been rapidly losing flesh for the previous year. Was very soon tired by either bodily or mental exertion, and quite incapable of any sustained effort. With the exception of anemia to the extent of sixty-five per cent of hemoglobin, physical examination revealed nothing abnormal. The gums were very unhealthy and there were several foul and decomposing stumps. The patient was at that time under the care of a dentist, who told her that the condition of her teeth and gums depended upon her general health, and that he could do nothing for her. As treatment directed to her neurasthenic condition had effected no improvement by August 23, she was sent to the Dental Hospital, where her mouth was placed in a healthy condition. From this moment improvement was rapid, and recovery was eventually complete.

Case 5. Neuritis.—Gertrude F., aged twenty-five, dressmaker. This was a typical case of neuritis commencing in the nerves of the legs. There was numbness, tingling, and tenderness along the course of the anterior tibials, with marked weakness of the muscles. On walking, she dragged her feet to a slight extent. Pyorrhea and stumps. Recovery in six weeks on treatment directed to the mouth. I may add that she had been treated for some weeks at St. Bartholomew's with electricity and arsenic without effect.

Case 6. Pseudo-angina—James J., aged thirty-one, book-maker, attended upon February 15, 1897, complaining of attacks of severe pain in the cardiac region which ran down his left arm as far as the elbow. Nothing abnormal could be made out in the heart, and the other organs of the body were also apparently healthy. He had not indulged to excess in either tobacco or alcohol. Bad pyorrhea and suppurating stump in the mouth. On restoration of the mouth to a healthy condition the patient recovered without any special treatment except an ordinary tonic.

On perusing the cases recorded by Dr. Hunter in his book, it is unfortunately evident that these have not been studied from the most modern standpoint of gastro-enterology, and consequently do not teach as much as they otherwise might. Nothing, for instance, is said as to the time relations of the symptoms to meals, and apparently the stomachs have not been examined either as to their muscular tone or as to the condition of their secretions. Noth-

ing is mentioned as to gastric splashing, or the condition of the stomach contents after a test meal. We can therefore only guess as to their precise nature. Case 1: "The patient suffered from severe intermittent sickness and gastric pain of eight months' duration, with loss of weight and increasing weakness." Case 2: "An old gentleman. . . . He came complaining of sickness and nausea, with disturbance of digestion and a foul taste in his mouth." Case 3: "Chronic indigestion, gastric pain, gastric catarrh. Pain two or three hours after taking food, with peculiar sinking feeling relieved only by eating." Case 5: "Gastric discomfort, gastric catarrh." In all these cases there was pyorrhea, upon the cure of which the gastric symptoms subsided. From the study of these cases it is apparent that they were probably chronic gastritis.

Within the last few weeks a typical case of gastric neurasthenia has been under my own observation. Miss M., a young lady twenty-four years of age, has suffered for the last two years from indigestion, which was diagnosed by her physician as gastric neurasthenia. Her symptoms were anorexia, and usually nausea after swallowing one or two mouthfuls of food. Pain, fullness, and flatulence during the digestive period, with occasional vomiting. Her medical adviser had made a physical examination, and gastric splashing was obtained during the whole of the interval between meals. There was no retention or stagnation of food, and no food residues in the stomach before breakfast. The gastric juice was apparently normal in composition. The patient had been getting thinner for some time. On examining the mouth there were seen several necrotic stumps, partly overgrown with hypertrophied and extremely sensitive gums, and typical bad pyorrhea, pus exuding from the tumefied tissues around all the teeth upon the slightest pressure. The lower anterior teeth were quite loose, the odor resembling that of decayed cabbage. The breath was extremely offensive, and the tongue furred. The case was taken in hand *secundum artem*, and even before the termination of the treatment the symptoms subsided, appetite developed, pain, fullness, and nausea disappeared, and the patient began to put on flesh. I mention this odor of decayed cabbage, as it appears to be typical in chronic pyorrhea.

B. *Systemic Effects from the Absorption of Toxins. Toxic Neuritis.*—This affection appears to be fairly common. Dr. Hunter

records the following cases: D. P., aged thirty-three, scene-shifter. Ill two and a half months, with wasting in both arms. Illness began with diarrhea and pains in the stomach, lasting about three weeks. About a month afterward noticed weakness in the hands, with feeling of stiffness, and the weakness extended up both arms. It was accompanied by a sensation of pins and needles. His mouth presented a condition of intense oral sepsis, dirty black teeth, many of them loose, and of extreme gingivitis. This case improved in a marked manner when the mouth was put in an aseptic condition.

Mary G., aged thirty-three, confined three months ago. Complaint began with wasting, weakness, and numbness of muscles of left thumb and fourth and middle fingers. Pain up the arm to the left shoulder; great nervousness. Illness began with numbness in fourth and fifth fingers, followed by pins and needles sensation. Some tenderness of left median nerve. Marked wasting of muscles of thenar and hypothenar eminences. Denture in upper jaw covering a number of teeth broken off; most intense gingivitis around roots. After treatment declared herself wonderfully better; has lost her sallow look and is fresh complexioned; can now grasp freely with the left hand. Besides these Dr. Hunter records several other similar cases, all of which were successfully treated when the oral sepsis was removed.

Gout and gouty glycosuria.—Korner draws attention to the connection of these affections with pyorrhea alveolaris. In his opinion, among the most important results of pyorrhea are the affections of metabolism, especially gout and diabetes. In the great majority of pyorrhea cases he finds sugar in the urine, and so much is this the case that he makes a careful examination of it in all cases where he finds the gums thus affected. He finds that pyorrhea is such a very early sign of a probable glycosuria that in many cases he has been enabled to make a diagnosis when the disease would not otherwise have been suspected.

As an apposite illustration of these facts I may mention the case of a patient who was under the care of Dr. Herschell, and whose mouth was subsequently treated by my colleague, Dr. Bradner-White. Mrs. W., a lady aged sixty; had been troubled for some years with subacute gout in the feet and ankles, and about the end of 1899 developed gouty eczema upon the legs, arms, and abdomen. She then came under the observation of Dr. Herschell, who dis-

covered both sugar and albumin in the urine and a very bad pyorrhea. The discharge from the gums was so excessive that it literally soaked the pillow during the night, and necessitated the use of several handkerchiefs during the day. The odor from the mouth was so offensive that one could hardly remain in the same room with her. Needless to say, her appetite was lost, and she had emaciated considerably during the past few months. On examination of the mouth a frightful condition of things was to be seen. A small gold plate carrying the two lower central incisors was immovably fixed in position by a gold clasp on either side. Over these the granulations from the gums had grown, and similar tongues of flesh were present between nearly all the lower teeth, in some cases overlapping the crowns. Her dentist, who had charge of the mouth, had particularly cautioned her not to remove this plate on any consideration, and it appears he had seen her frequently without noticing the pyorrhea. The treatment was entirely successful. To save time, the tips of the granulating gums were removed with scissors, the plate extracted, and removal of the deposits effected; a spraying with hydrozone and application of silver nitrate soon brought the gums to a healthy condition. It was subsequently found possible to draw the teeth in the lower jaw together in such a manner that artificial teeth were not required. As the result of the treatment the eczema promptly subsided, the sugar disappeared, the appetite returned, and up to date the patient has had no return of her troubles.

Chronic rheumatic arthritis.—Mr. McNamara, in the course of a discussion upon the relations of rheumatism, made the following remarks: "He commented on the toxic origin of rheumatoid arthritis, and said that it was evident that some of the chemical substances produced by specific microorganisms led to rapid destruction of tissue, as witnessed in pyemia. . . . He quoted a case in which a woman of twenty-five suffered from typically deformed and fixed joints, attributed to the absorption of septic matter from the sockets of teeth affected with dental caries." This case, evidently from the description a typical one of pyorrhea alveolaris, was successfully treated after the mouth had been put into a condition of health, although all previous treatment had been in vain.

A vicious circle may frequently be established where pyorrhea upsets general nutrition and lowers the resisting power of the gums to the external agents acting upon them, thus aggravating the dis-

case, which in turn keeps up the gastric disturbances and produces nervous trouble by absorption of toxin from the pus continually swallowed.

Diagnosis.—According to Dr. Hunter, the majority of the sufferers from chronic oral sepsis have a dirty, ashy-gray look, and suffer from general languor, irritability, and feelings of intense depression. When, in addition to these, we find a gastritis or neuritis, or a gouty rash, and, moreover, on examining the mouth find the well-known signs of pyorrhea or septic stumps, we shall be justified in concluding that the general constitutional condition may very possibly be the result of the local condition.

Treatment.—We now come to the most important part of my subject. How shall we best cure the cases of pyorrhea alveolaris which come under our hands? I think that we are all agreed as to the first stage of treatment—the removal of all deposits from the teeth, both above and below the edges of the gums. This must be done thoroughly, as the smallest little spicule of calculus left behind will keep up the irritation. We must not therefore grudge the time which it is necessary to expend, and our patients must also be educated up to the point of not grudging us fair remuneration for our work. Many sittings are often required to complete the work, and patience is necessary on the part of both dentist and patient.

It is in the subsequent treatment of the pus-pockets that differences of treatment arise. One could fill many lines of print with a bare enumeration of the different drugs and chemicals which have been applied to the long-suffering patient—trichloroacetic, sulfuric, nitric acids, copper sulfate, hydrogen peroxid, carbolic acid, quinin sulfate, etc., to say nothing of cupric electrolysis and the actual cautery, all of which have their advocates. Without discussing the respective merits of these, I shall confine myself to briefly indicating the method which I have adopted in my own practice, and which I have found to give me the best results. First remove all the deposit which it is possible to get away with instruments, and then with a flattened, fine point of soft wood rub the necks and down on the roots with aromatic sulfuric acid, to be followed immediately with sodium bicarbonate. This process leaves the pockets absolutely clean and the roots smooth. All will agree that the perfect removal of all irritating bodies is a *sine quâ non* for further treatment. For the treatment of the diseased conditions of the gums I

rely upon preparations of silver, which are without doubt the most efficient germicides for our purpose, and at the same time have a most happy effect in stimulating the gums to a healthy action and in hardening them by their powerful astringent properties.

I use the nitrate in the form of a saturated solution carried on a bit of absorbent cotton, or the pure crystals melted on to the point of a platinum broach, and I use argentamin. This latter drug, prepared by Schering, is a solution of silver nitrate in ethylendiamin. It is a powerful antiseptic and germicide, and has the great advantages over silver nitrate that it is alkaline, in reaction does not precipitate chlorids or albuminoids, and penetrates deeply into the tissues. It is thus an ideal agent for the treatment of pus-pockets. It is best to begin with a weak solution, say ten per cent, and subsequently to double this strength. I apply it to the interior of the pockets with a tiny piece of absorbent cotton wrapped round a fine silver probe. The result of this treatment is often almost miraculous. In a very few days the whole appearance of the mouth is altered, and the discharge ceases; the gums become firm and contract tightly around the teeth, and an application at intervals for the next few months will in most cases practically cure this obstinate affection. As a subsequent mouth-wash to be used with a brush, I have obtained the best results from preparations containing salicylic acid and ratany, to be twice used daily. These two drugs seem to possess peculiar properties in maintaining the gums in a healthy condition and the mouth in an aseptic state.—*Cosmos, Jan., 1902.*

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OBTUNDENTS—DENTAL. By Charles S. Moore, D.D.S., Philadelphia. Read before the Penna. Assn. of Dental Surgeons, Dec. 10, 1901. An obtundent, medically speaking, is an agent having the power to dull or overcome pain, a soothing application, or a local or partial anesthetic. It may be a substance which sheathes a part and so blunts irritation; a bland, oily, or mucilaginous application, a demulcent. We have as examples, opium and its derivatives, the various modifications of cocain, gum arabic, glycerin, olive oil, etc. The anesthetics, when their effects are limited to a mere obtunding of sensation, are generally termed obtundents. We may in a general way state the difference between an anesthetic and an obtundent by saying that an anesthetic is an agent completely obliterating sensation; as in most cases anesthetics

practically produce absolute unconsciousness, partial or general, while obtundent merely relieves the painful sensation. Some agents are properly classed under both heads; for instance, the various ethers, which are obtundents or anesthetics accordingly as they are applied or corresponding to the degree of their effect. Common usage accepts this liberal if not exact construction of the term, and many medicaments, because of their ability to produce semi-insensibility or local anesthesia, are classed as obtundents. For convenience sake the first classification will be made with this in view, and will be designated, first, those relieving pain, as oil of cloves; and second, those producing an insensibility to pain, as cocain.

To the first class belong the mild-acting obtundents, oil of cloves, ordinary chalk, milk of magnesia, and spirits of camphor. In the second class are those drugs producing an insensibility to pain, as cocain, nitric acid, carbolic acid, ethyl chlorid, etc. It is a convenience to again subclass these drugs in accordance with their therapeutic action, i. e.: 1. Those acting upon the nervous elements of the dentinal tubules, producing paralysis and thereby interfering with the transmission of pain impressions, such as cocain, the ethers, etc. 2. Those acting upon the protoplasmic substances in the tubuli, coagulating the albumins of the same and thereby destroying their ability to convey pain sensation. To this division belong carbolic acid, nitrate of silver, etc. 3. Those acting by dehydrating the contents of the tubuli and thus removing the most potent element that assists in the transmission of pain impulses. Examples: alcohol, chlorid of zinc, and hot air. 4. Those neutralizing acid conditions directly causative of hypersensitiveness and thereby destroying the cause of pain, such as bicarbonate of soda. 5. Those disintegrating the protoplasmic contents of the tubuli and thus destroying the means of transmitting impressions; such as chromic and nitric acids.

Under the different class headings, according to clinical references, the peculiar action of drugs used in general dental practice as obtundents is as follows: Under Class 1, those paralyzing the nervous elements of the tubules are: Cocain. Dr. Jeay, in a paper read before the Third International Dental Congress, remarks that, "In the absence of electrical appliances, hot air and saturated solutions of cocain and menthol in alcohol are the only means that give good results without disturbing the physiological integrity of the

pulp." Cocain hydrochlorate dissolved in water is not efficient on account of the solution having but little penetrating power. The diffusion of the moisture of the tooth in the solution of cocain is not great, inasmuch as the two fluids have about the same index of capillary attraction. A very penetrating preparation of cocain, known as vapocain, made by McKesson and Robbins, overcomes the fault of the aqueous solution, as the salt is dissolved in ether, which has a higher index of attraction than water. Dr. S. G. Perry remarks of vapocain, "I have not met a single case where I have not been able by patience to produce a marked effect on the tooth, and make it bearable in a few minutes." Instructions for its use, as given in the maker's circular, are as follows: Apply the dam and dry the cavity with hot air, place a pellet of cotton in the cavity, and drop vapocain upon it until saturated; allow the cotton to remain, keeping it thoroughly saturated with the medicament from two to five minutes. To prevent too rapid evaporation it is wise to cover the cavity with a piece of rubber.

In Gorgas' "Dental Medicine" the following prescription is given: Cocain hydrochlorate (crystals), gr. x; tragacanth glyceritum q.s. M. Sig.—Insert a minute portion in the cavity half an hour before operating.

Dr. E. A. Bogue strongly recommends veratria in combination with carbolic acid, and suggests the following formula: Veratria, gr. vi; pure carbolic acid, gr. vi; absolute alcohol, m. vi; glycerin, gtt. v. He directs that after the tooth is protected with rubber-dam the medicament shall be applied and the operator proceed with some other case; on returning to the first one it is cleansed with alcohol, and after air-drying the cavity the excavation is made.

Under Class 2 the coagulants find an appropriate place. Carbolic acid has been perhaps most frequently used, but it is not of much service when an immediate effect is desired. Partially air-drying the cavity before its application is a decided advantage; it is better, however, to seal it in the cavity for a few days. It may be combined with morphia, tannic acid, or oil of cloves. Dr. E. T. Darby advises as follows: Dry the cavity with hot air, then apply absolute alcohol, dry again, and apply carbolic acid. This procedure is to be repeated three times. Carbolic acid combined with an equal part of caustic potassa forms the well-known "Robinson's Remedy," an efficient obtundent. It is also an active caustic and calls for care

in its use. Chlorid of zinc is applicable in all cases where cavities do not closely encroach upon pulp territory; it may be used in these with comparative safety if the deeper portions are protected by an insoluble covering, such as chloro-percha. As a rule it is well to restrict its use to superficial cavities, using it in deeper ones only when milder remedies have failed to produce the desired effect. The severe pain usually following its application may be much reduced by first applying carbolic acid, which does not in any manner interfere with its action. While it may be used in solution, crystals of the chemically pure salt are more convenient, and are more readily restricted to the surface upon which its effect is desired. It is well to remember that it may have a continuing action. It is now recognized that the idea formerly held that coagulants were held in check by the product of their union with albumin is an error; they readily pass through this and continue their effect until exhausted chemically. Zinc chlorid appears to have a double action—it not only coagulates the albuminous contents of the tubules, but also abstracts the water therein; hence it is more active in the form of crystals.

Nitrate of silver, on account of the discoloration which usually follows its application, can be used only in superficial cavities in the back part of the mouth and as an application to the deciduous teeth. Wherever this discoloration is not objectionable, the drug is invaluable. It is particularly useful in relieving hypersensitiveness at the necks of teeth in cases of gum recession and erosion. It must, however, be used with care. Dr. Truman demonstrated a few years ago that nitrate of silver was a most penetrating coagulant, and suggested that it might prove as dangerous to the vitality of the pulp as is zinc chlorid. His conclusions were at that time disputed; they have since been confirmed and are now generally accepted. Arsenious acid is mentioned only to be condemned, it should never be used except where devitalization of the pulp is desired.

The above list does not by any means exhaust the list of available drugs classed as coagulants. Most of the essential oils have this property in a greater or less degree, and in many cases are to be preferred to more active agents.

Under Class 3, those dehydrating the protoplasmic contents of the tubuli, heated air may be given first place. Used alone it is effective, not alone on account of the heat it conveys producing evaporation, but also because the heating process has deprived it of

a portion of moisture which it again takes up from the dentin against which it is directed. Absolute alcohol, which has a strong affinity for water, rapidly combines with that in the tubules, which is dissipated with the alcohol by evaporation. Chlorid of zinc also dehydrates the contents of the tubules by combining with the water contained therein.

Sodium bicarbonate is the principal type of medicaments included under Class 4, those neutralizing acid conditions causative of hypersensitiveness. It is, in fact, about the only one that has proved desirable in producing a condition of toleration to operative procedures. Dr. E. C. Kirk remarks concerning this agent, "I find sodium carbonate to be a local sedative and obtundent in the treatment of sensitive dentin, not successful in every case, but having a marked effect in allaying hyperesthesia in very many instances. It is best applied in the form of a thick paste to a perfectly dry cavity. The application causes momentary pain, which is followed by its rapid cessation, and in most instances by a decided anesthesia of the dentin. As pain returns during the operation of excavation the application must be renewed." Eroded surfaces and hypersensitive cavities on the labio-cervical aspect of the molar teeth are locations where this treatment is successfully used. The bicarbonate, however, is usually preferred.

Under Class 5, drugs destroying the protoplasmic contents of the tubuli, chromic and nitric acids are the most pronounced examples. While chromic acid is a coagulant, it at the same time rapidly destroys, decomposing the organic substance of the tooth in the same manner as nitric acid. They are of service in extremely sensitive, very shallow cavities. Before attempting their use the adjacent tissues should be carefully protected. They are applied by being carried in small quantity upon a gold probe.

No mention is herein made of cataphoresis, for the reason that the subject cannot be treated in a small space, nor by one who has had no practical experience in its application. Excluding it, there still remains a sufficient number of drugs for intelligent treatment of hypersensitive dentin. Indeed, the necessity for treatment arises from so many differing causes that satisfactory results can be obtained only through proper study, first, of the causes, and second, of the agents curative of the disorder. It has well been said that a remedy which may in one case give certain relief may in another be of but a little service.

A brief mention may be made of obtunding agents used upon the soft tissues in such operations as preparing roots for crowning, or for fitting the same. A few crystals of cocain hydrochlorate dissolved in alcohol and applied over the gum will render an unpleasant operation bearable. Peronin (benzylic ether of morphia) is recommended by Dr. Benvenuti, in two per cent solutions in hot water. When applied to the gums for two or three minutes sufficient anesthesia is produced for extraction of the teeth.—*Brief, Feb., 1902.*

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SILVER NITRATE ON INFLAMED MUCOUS MEMBRANES. However, as an astringent to the mucous membrane of the nose, the extract of suprarenal capsules or its newly discovered alkaloid, adrenalin, is the most powerful known. The alkaloid is active in the strength of one to ten thousand parts of water, and within sixty seconds after its application blanches the nasal mucous membrane to a creamy white. Whether the irritant or sedative effects of silver nitrate predominate depends largely upon the character of the epithelial layer of the mucous membrane to which it is applied. If a sixty-grain solution be painted upon the posterior wall of the pharynx the irritating quality is manifested and produces discomfort persisting for sometime. If, however, this solution be painted upon inflamed tonsils and the inflamed lateral wall of the pharynx, the primary irritant qualities of the nitrates are scarcely perceptible, and the procedure is followed by a sense of great relief and comfort. Painting the lateral walls of the pharynx with a sixty-grain solution two or three times a day is one of the best methods of aborting acute pharyngitis and tonsillitis. The reddened parts are at once blanched, partly as the result of the astringent effects of the silver and partly as the result of the formation of a closely adherent organic compound of the silver. The sedative effects of the application are so marked that the patient is usually able to at once swallow without much discomfort. The posterior wall of the pharynx should then be painted with a twenty-grain solution of protargol. This treatment, if repeated twice or thrice a day for two or three days, will in a large proportion of cases abort phlegmonous tonsillitis.—Dr. E. B. Gleason in *Therapeutic Gazette.*

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PHYSICIAN'S PRESCRIPTION. The following is a summary of the common sense and legal status of the physician's prescription,

so far as it has been defined, according to Jervey: 1. The patient has no legal nor other right to demand a written prescription or written directions from the physician. 2. It is right and wise that the druggist demand and procure from the physician his written orders for the compounding of prescriptions. 3. The physician has the undoubted right to designate what pharmacist shall fill his prescription. 4. The written prescription is simply an order from physician to pharmacist. It is, through courtesy and by virtue of custom and convenience, handed to the patient for transmission; but the latter has not at any time the slightest right of possession in the instrument. 5. The druggist has at least the right of permanent guardianship (perhaps the outright possession) of the prescription, and he must keep it on file for reference and for any form of proper investigation. 6. There can be no right, extenuation or excuse for a copy of a prescription, with physician's name attached, to be taken by druggist, patient, or any one else, without the authority of the physician. 7. The careful physician should invariably retain a carbon-paper facsimile copy of every prescription he writes. 8. The druggist has a legal right to utilize any formula that is uncopyrighted that may fall into his hands, but he cannot, unauthorized use the name of its author in connection with it. In most states, however, statutes would bar his selling intoxicants or other poisons except by direct order of physicians. 9. If a druggist refills a prescription without the order of the physician who wrote it, he does so on his own responsibility, and he has no legal or moral right to leave or place the physician's name on the container.—*Jour. Am. Med. Assn.*

LEAD LINE UPON THE GUMS AN IMPORTANT FACTOR IN THE DIAGNOSIS OF LEAD POISONING.—Sir W. R. Gowers (*Lancet*) discusses lead and arsenic poisoning. He places great stress on the lead line on the gums as an aid to diagnosis. In rare cases it may be absent, but far more frequently it exists only in fragments. It may be at but two or three isolated spots, or at the tips of the projections of the gum between the teeth. Both the upper and the lower jaw should be carefully searched with a magnifying glass. If the symptoms of the patient are such as to suggest lead, and there is no line traceable on any part of the gums, one may be confident that it is not at work, provided the state of the gums is such as would give rise to it, meaning by this that the gums in places do not adhere closely to the teeth, thus allowing the deposition of albuminous material from the food, with which the lead combines, forming the sulfid. But if the gums are very perfect lead as a factor in disease cannot be thus eliminated.

Letters.

THE BOSS AND DOCK MEASLEY CONFER ON THE SUBJECT OF DENTAL LEGISLATION.

(AS TOLD BY THE OFFICE BOY.)

The Boss he's took a Great Shine to Dock Measley lately. He goes to see him most every day. Says he to me, "James, there's a Rising Young Man in dentistry, don't you forget it. Dock Measley's young, an' some thinks he's Offul Fresh, but you Watch Out an' you'll see where he Lands after a While. He's a Comer, James, no mistake about that. He ain't only Twenty-Four years old, but he's got the Gumption o' lots o' Dentists of a Hundred an' Twenty Four. It won't do to Underrate him, James, even if he ain't got a Prince Heinie polish as yet. After he's Bumped around the country in Parlor Cars a few years, attendin' State Dental Society Meetings, you'll see him lookin' Slick as a Seven Hundred Doler Seal-Skin Sacque."

One Mornin' the Boss he was at Dock Measley's offis, an' a lady she' called a-purpose to Abuse him about a Tooth she wouldn't let him Fill Right. So I said I'd go after him, an' she said fer me to go an' to Hurry him Up, 'cause she was a-layin' fer him, an' it was her purpose to give him Peticular Fits. So I went, an' I told him the Cook wanted him to Fetch some German Soap fer Scrubbin' when he Come, an' I never said nothin' about the Woman what was Waitin', 'cause I knowed it wouldn't specially interest him. The Boss he said he'd Bring the Soap, an' then he settled down in his Chair, an' he looked at Dock Measley reel Respectful, like he Reelized how Kind an' Obligin' Dock Measley was to Learn him all about Dentistry. I set down behind the Door, where the Boss wouldn't See Me too easy, an' perhaps send me Back, an' I listened to what was a-goin' on.

Directly they started to talking about Dental Legislation, that is making laws an' fixing things so as a Dentist he won't have no Legal Right to practice, even if he does know all about stopping Tooth Ache, an' Filling Teeth, an' Pulling 'em, an' makin' Plates an' Bridges, but will be liable to git himself Jugged, without he knows all about Diptheory, an' what the Pectoralis Major muscle

opens an' shets, an' the Symptoms of Compound Fractures, an' lots o' Things. The Boss an' Dock Measley was exchanging Views, talking about what had best be Done. Dock Measley let the Boss talk.

The Boss ain't so Stuck on Modern Measures, as he calls 'em, fer elevating the Perfession an' Dignifying Dentistry. He says, dern this Dignifyin' Dentistry; let Dentistry dignify itself! The thing needed to Dignify Dentistry is some practical scheme fer making folks Pay Up. Why don't they talk about Dignifyin' the Law, an' Medicine! He thinks some o' the men that's raisin' sech a Howl about Students not having a High-School eddication before they enter the Dental College, er not knowing no Latin ner Greek, orter be Required to pass a Examination theirselves in Two-Syllable Spelling an' Grammar. He says the Reel an' Proper way to straighten matters Out, is to Strike at the Root o' the Evil—meanin', jis' betwixt me an' you, the Dental Colleges. (What he'd like to see is the Dental Colleges completely Busted Up, an' the good old times restored when a dentist could rush through any old sort of a Job an' git Big Pay for it. He ain't in favor o' having so Menny young Dentists; says they don't Conform to Time-Honored Standards, is Conceity, an' ain't Respectful to the older members o' the Perfession.)

The Boss he said some o' these things to Dock Measley, an' Dock Measley of course never took no offense, he ranking himself among the Older Men, having been two years at the Chair. Then Dock Measley he kind o' winked, an' he sent one o' them Wireless Dispatches by the new Macaroni Process across the Room to the Boss, an' I ketched on to it, notwithstanding they claim no Outsider kin tell what the message is. What Dock Measley said in Cipher Dispatch, (that he didn't want me to Read, yet I did read it), was this, plain as Day. Says he, "I ain't so Offul Stuck on these Legislatin' Schemes, yit I ain't so Hostile to them as I Ust to Be. They was a Time when I thought the whole business o' Legislatin' agin men practicin' dentistry without a license was a Scheme to Drive young men into the Dental Colleges an' help put Money in the Faculties' Pockets. There had to be a Pretense of Impartiality, so the Alternative was Offered of Passin' a Examination before a State Board of Examiners. My idee ust to be that in Time the Dental Colleges would manipulate things so that the State Boards wouldn't amount to Nothin', an' the only Avenue for Entrance into the Practice o' Dentistry would be through the Colleges."

Dock Measley must of seen I was Ketchin' on, anyway, fer he talked right out loud, sayin' the rest he had to say. Says he: "I say, I wasn't never so Offul Stuck on this Legislatin' Scheme, yit I Ust to let on I approved, fer fear the Perfession would think I wasn't Progressive. I was jis' out o' the Dental College, an' I was Dead Sure o' succeedin' in Practice, fer I seen the College prosperin', an' makin' this, that an' the other improvement on no Margin at all, the charges fer services rendered to the Indigent Public bein' merely fer material actually used, an' so I reasoned that by a moderate amount o' Hustlin' I could git control of a somewhat Higher Class o' Patrons, an' git Ritch in no time. But when I come to Practicin', I was led after awhile to Suspicion that the Hull Body o' recent graduates practicin' in the City was reely only Dental College Students kind o' out on Parole. They wasn't actually under Indictment fer remainin' in Town an' openin' Offices in opposition to the Dental College after Graduatin', but they was somehow left to Gather the Impression that what the Old, Established Practitioners in the City couldn't attend to, the Dental Colleges could, an' so they'd better try some Other Location. This some o' them done; others staid, an' Organized more Dental Colleges. Sometimes you'd find a Young Practitioner Offul Rabbid agin the Dental Colleges, but once he'd Started one himself, all his Maniacal Ravings would Cease.

"But now, I say, my sentiments is wholly changed. I don't Carrot Am if the State Board of Examiners doos come to be Abolished finally, an' nothin' remain fer Aspirants fer Dental Honors but to spend Four Years and Four Thousand Dolers in some Dental College. Things has took on a new Aspect of late, promisin' a brighter Future fer us members already in the Perfession. The Advanced Idee seems to be this—to limit the class of Matriculates at the Dental Colleges to them that's so Highly Eddicated in High Schools an' Colleges that when they Graduate at the Dental College they won't have no Taste fer Practical Dentistry. Which of Course means they won't come into active Competition with Practicin' Dentists. Before they'll admit them to the Dental College they've got to know Sanscrit, an' Chaldee, an' the Integration of Rational Fractions from the Ground Floor up. The Scheme 'll jist be the salvation of us Older Fellers. It's another thing; it's Salve to the class o' Dentists that's more than Haf Ashamed o' bein' only

Dentists,' an' has Utopian Notions o' Exaltin' Dentistry into the realm o' the Classics.

But the reel, savin' Clause o' the Scheme is this, the Dental Faculties knows that students that cares so Offul Mutch fer Compound Fractures, an' Adenoids, an' Rhinoplasty, an' the Exanthema, ain't sech Formidable Rivals when it comes to Good Impressions an' Correct Bites. But they're Fine Ornaments to a Tri-State Dental Meeting, an' ef they ain't o' Mutch Weight as Dental Practitioners, they help to swell the General Average o' Perfessional Respectability. Take it all in all, it's Doubtful whether the Mass o' the Perfession is sufficiently Grateful fer what the Dental Colleges is doing fer the Perfession. It's doubtful whether there's any other Influence so well calculated to eradicate the Itch fer Practical Dentistry out of a Student, as some o' the Dental Colleges. An' yet lots o' Dentists in Active Practice is Hostile to the Colleges! They doesn't seem to Appreciate the Fact that the Dental Colleges is doing their Best to raise Dentistry in the United States to the Plane o' European Dentistry—that is, Sublimated Theory exalted far above the Sordid Demands of Practical Toothache. So I say, in Conclusion, let the Dental Colleges alone, let 'em Work Out their Beneficent Scheme. If they want to legislate, let 'em do it. They may not make many Practical Dentists, but think of the Crops of College Professors forthcoming!"

The Boss he seemed to be Deeply Impressed by what Dock Measley said. Says he, "Well, mebbe I *have* had the wrong Idee about the scheme o' Dental Legislation. I see now it's all in the Interests o' Existin' Institutions. Young men that wants to be Dentists is to be encouraged to be somethin' else, somethin' Higher than Dentists. The young man that inclines to Plaster Impressions, an' Regulatin' Appliances, an' the like, is bein' told to go to school an' master Latin an' Greek, so's he'll be capable o' Graspin' the principles o' Theoretical Medicine, when he comes to the Dental College. Then mebbe he'll conclude to be a Physician, after all. It's what I call a good Conservative Scheme. It's a protection to the Young Men against Dentistry, an' it's a Protection to Dentistry against the Young Men. I admit everybody'd orter be Satisfied."

The Boss he looked like he'd took Fresh Courage, an' could go back to the shop an' Bang his Nêw Sterilizer out into the Alley, an' never bother no more about wiping off his Forceps, ner Nothing.

'Cause you see, there wouldn't be so Menny young Dentists comin' on, pesterin' the Older Men about Germs, an' Sterilizin', an' other things that Dentists ust to leave fer the Patient ter Tackle.

"I tell you though, Dock Measley, what the Perfession needs most of All, in my Opinion, is Colleges fer educatin' the Public up to our Perfessional Standard. I'd be in favor of Taxation fer that Purpose. Make it a Law that nobody kin come into a Dentist's Offis without he's got a Diploma in his Pocket certifyin' that he's tractable, confidin', an' prepared to Pay," said the Boss. Dock Measley looked Doubtful. "I'll tell you what I will do, Dock Contour, when I start my Dental College I'm a-goin' to adopt for our motto, 'Live an' let live.' I'm a-goin' to limit the amount of Filling to be done for Any One Patient to Thirty-Two teeth."

Cincinnati, O.

FRANK W. SAGE, D.D.S.

EXTRACTION OF ARTIFICIAL TEETH.—Batsch (*Muen. Med. Woch.*) reports the case of a man who had swallowed a plate carrying several artificial teeth. It was impossible to discover the position by means of the Roentgen rays, but it could be accurately located by means of the esophageal sound, which touched it at a distance of 36 cm. from the natural teeth. An attempt to remove by means of forceps failed, and therefore the sound was reintroduced and the plate forced into the stomach, an operation that caused considerable pain. The patient was then instructed to eat large quantities of coarse vegetables, with the idea of enclosing the teeth and preventing them from injuring the intestine in their further passage downward. After several days they were actually found in a copious evacuation.

ACTION OF AMMONIA ON METALS.—G. T. Bellby and G. G. Henderson have exposed platinum, gold, silver, copper, iron, nickel, and cobalt to the action of ammonia at temperatures ranging from 400 deg. to 900 deg. In every case the physical effect of the treatment was to disintegrate the metal completely, whilst a large proportion of the ammonia was resolved into its elements. The fracture of metals which have been exposed to this action is spongy or cellular; under the microscope the metal appears as if it had been suddenly cooled while in a state of active effervescence. The penetration of the ammonia molecules into the metal is remarkably quick if the conditions are favorable. The authors believe that the physical effects which result from the action of ammonia upon metals at high temperatures are due to the alternate formation and dissociation of nitrites taking place between certain narrow limits of temperature, the reaction going in one direction or the other according as ammonia or hydrogen molecules preponderate in the gases which are in contact with the molecules of the metal at and below the surface. In several cases the formation of nitrites has been definitely proved. The absorption of small quantities of nitrogen by pure iron renders it hard and brittle like steel.—*Proc. Chem. Soc.*

The Dental Digest.

PUBLISHED THE FIFTEENTH DAY OF EVERY MONTH

At 2231 Prairie Avenue, Chicago,

Where All Communications Should be Addressed.

Editorial.

DATE OF NATIONAL MEETING CHANGED.

Just at time of going to press we learn that the officers of the National Dental Association have decided to change the date of meeting to July 28-31. We will give fuller particulars in the next issue. The meeting at Niagara Falls in 1899 was probably the largest one ever held by the National, and we hope everyone will work to make this meeting still bigger and more successful.

CROWN COMPANY AGAIN RUN.

Among the many suits brought by the International Tooth Crown Co. against the members of the Dental Protective Association some months ago were several in the State of New Jersey. One of these, same being against Dr. J. S. Vinson of Newark, was docketed for trial this month, and we supposed the Crown Co. expected to prosecute the case, as it was the only one in that state in which they had taken testimony. The attorneys of the Protective Association prepared the defense, but we learned last week, greatly to our surprise, that the Crown Co. had paid the costs of the case and had it dismissed, which is positive proof that they were afraid to have it come to trial. The Crown Co. are therefore confined at the present time to the state of New York, and Judge Lacombe, ruling in that Federal District, has refused to hear any more cases until the Court of Appeals has passed on the one in which he recently gave a decision. It cannot be definitely stated when this decision will be handed down.

DENTIST-PHYSICIAN OR PHYSICIAN-DENTIST.

We would call the special attention of our readers to the article in the February Digest by Dr. O. N. Heise, entitled "Dentistry as a Specialty of Medicine," and to the article in the current issue by

Dr. Frank W. Sage, entitled "The Real Attitude of the Dental Specialty Toward Medicine." Dr. Sage's "Office Boy's Letter" in this issue also treats of the same subject from a humorous standpoint. Dr. Heise and Dr. Sage hold opposite views, and opinion generally seems to be divided as to whether dentistry is a specialty of medicine or a separate and distinct profession, capable of standing alone. Personally, we should hold a middle view. The dentist is primarily a mechanic, and a student with mechanical genius and a fair education will make a better dentist, in the general acceptance of the term, than a student utterly lacking in mechanical talent, but possessing a broad, thorough education. We do not mean by this that students with only mechanical ability should be admitted to our dental colleges, for that would soon bring dentistry to the level of a trade pure and simple. On the other hand, we do not believe students who have only a fine education should be accepted, as that would make us a class of theorists. The fact that there are to-day over one hundred dental laboratories throughout the country, doing all the mechanical work for a large number of dentists, is a sad commentary on the mechanical training or ability of the average practitioner.

First of all the student must have mechanical ability or he cannot practice dentistry, but it is just as essential that he possess a thorough general education and have a mind trained by study and observation. Otherwise, he is fit for nothing but the purely mechanical work and cannot rank as a dentist. If a student has these two qualifications, mechanical and intellectual, he should be able to obtain in the dental college all the knowledge of general medicine which he will be apt to need, and we believe all the first-class schools to-day give him that opportunity if he will embrace it. While we should urge the student to take a medical course before entering a dental college, if he has the time, money and desire to do so, we would recommend it for its broadening and deepening influences, and not because we think a man must be a physician first and a dentist next. This latter seems to be the view held in Europe, and as a consequence of the exaltation of general medicine above the dental specialty, the mass of the people over there suffer from lack of any dental service whatever.

However, dentistry in this country seems to be working out its own salvation, and if the dental colleges extend their courses of

study to meet the requirements made upon a dentist in active practice, and see to it that only well balanced students, those possessing both mechanical skill and a broad education, are admitted, we need have no fear that the reputation of our profession will suffer. The colleges deserve all credit for their continued efforts to raise the standard, and we think the matter can be safely left in their hands.

ARMY DENTISTS AND DENTAL SOCIETIES.

In the December *Review* Dr. Harlan expressed himself editorially as follows on "The Army Dentist":

"From the paper of the president of the Army Dental Board, published in the *DENTAL DIGEST* for November, it appears that twenty-seven of the posts have been filled and that three positions are vacant. We presume that the dental societies of this country will be glad to welcome the occupants of these posts to membership in the societies adjacent to the army posts. So far as Chicago is concerned, the membership has been proffered to Dr. W. C. Fischer, who is located at Fort Sheridan. We had hoped that all dental societies would receive the army dental surgeon as a member, as soon as he was appointed, with open arms. At the last meeting of the Chicago Dental Society a resolution was passed giving the dental surgeon at Fort Sheridan all the privileges of membership to Dr. Fischer, but not providing for his successor in case he was transferred to some other post. We think that the least a society can do is to extend the courtesy of membership to a dental surgeon without dues, as he is liable to be sent elsewhere on short notice, and it seems only fair that he should be received with open arms by his compeers. For some reason best known to the army of objectors this was denied at the last meeting of the leading local society of Chicago by the usual objectors to all forms of real courtesy. Any member of the medical corps of the army and navy goes into a meeting feeling that he is welcome to all privileges without dues. This is an invitation to all societies to extend a welcome to army dentists and full fellowship at all times and under all circumstances."

In the March *International* Dr. Truman takes issue with the above opinion, on the ground that he thinks the army dentists are abundantly able to pay the yearly dues in a dental society, and that they should not accept pecuniary favors from any source. Dr. Truman is quite right, but we think the point he brings up is not of so much importance as others which might be urged.

At the meeting of the Chicago Dental Society above referred to we opposed the resolution because we did not wish to see the society pledge itself to accept as a member, or to extend the courtesies of the

floor to, any army dentist who might be located in the vicinity, regardless of his eligibility. We did not suppose an appointment to one of these army positions was a guarantee of unimpeachable character, and inasmuch as all other dentists who are admitted to societies must be passed upon by a board of censors, we saw no reason why the army dentist should be made an exception to this rule, which is instituted merely to protect the society and its members against undesirable additions. We hope to see all these army appointees join the societies in their vicinity, as they certainly will be benefitted thereby, and should also be able to present some very interesting experiences to their confreres, but we believe they should be admitted to membership under the same conditions as are other members of the profession.

The president of the Army Dental Examining Board has publicly endorsed the opinion of the *Review*, which somewhat surprises us, as we did not suppose Dr. Marshall considered attendance upon dental society meetings essential to the successful practice of dentistry. At least, this was the inference which we drew from his devoting his time and talents to medical rather than to dental societies, and from the fact that he made the examinations for appointment to army positions of a medical rather than of a dental character. Perhaps, however, he has changed his views on this subject during the last few months, and if so we congratulate him.

RELATION OF THE RECENT GRADUATE TO THE DENTAL SOCIETY, AND VICE VERSA.

The dental colleges will soon graduate their classes for this year, so a few words on the above subject may not be out of place. We have before us a bound copy of the papers and proceedings of the last meeting of the National Dental Association, and the book is evidence sufficient that within the membership of the Association are men who are thoughtful, industrious and practical. Men whose years of laborious experience have taught them that the profession of dentistry, however much it may have been, or may be at the present time, handicapped by ignorance and indifference, is now enjoying the fruits of professional evolution to as great a degree as any other industry that has blessed the human family within the last century. Every paper that was read, notwithstanding any criticism that might be bestowed upon it, is absolute proof of an

earnest desire not only for the betterment of the organization and the profession, but for a higher and brighter position of the writer. The disinterested listener certainly could not infer, either from the papers or discussions, that egotism or self-aggrandizement was the object in view.

Neither the public nor the medical profession appreciate the varied talent, the noble aspirations, and the unselfish spirit that pervade the dental profession. Many men are to-day pursuing the unobtrusive practice of dentistry who, had their energies and talent been so directed, would have been just as successful in medicine, law and other arts and sciences. Unless one has been so situated as to be familiar with the demands made upon the average practitioner, he has no idea of the range of talent he must possess who would occupy the highest position in the dental profession. There are no soft spots in dentistry; at least, your editor has never found them.

To the recent graduate these few lines will indicate the field before him, but above all things we desire to impress upon the young men entering the profession the almost unlimited advantage to be gained by association. No truer word was ever spoken than that emphasizing the glory of meeting together. The expression has been used in a religious sense, but it is just as true in a scientific, social or professional one. Though your associate or comrade should have nothing superior to your own accomplishments or knowledge, yet the friction of interchange of thought invariably stimulates and develops new ideas, so that two or more men can rarely converse on any subject without either intensifying preconceived beliefs or developing some original trend.

In the first place, each young dentist should feel it his duty to join and help support at least one society, for he is today receiving the benefits of what others have done in society work, and should reciprocate so far as lies in his power. Again, he is merely entering upon the practice of dentistry when he leaves college, and must continue to study and grow or he will be a failure. Experience is the great teacher, and the young man should take advantage of the experience of those older than himself. This can be done in no other way so well as through the dental societies. The dental journals are broadening influences, and the young man should read them religiously, but they can never supersede society work, as they lack the social element and do not make the same impression

that the article at first hand does. The social feature of society work is most attractive and valuable, and it is a notable fact that all progress and investigation has come from those men who are devoted attendants upon one and usually several dental associations.

The young men in the profession today have every advantage over the early careers of those who are now enjoying the fruit of the experience of years. Even as late as forty years ago the crude and barren conditions with which the student had to contend were discouraging almost beyond description, but the pluck and perseverance that controlled the actions of those days made the men of today. Let the younger ones in our profession therefore be mindful of the responsibility put upon them, so that they may be as reverently spoken of by the coming generations as are their elders today.

Notices.

EASTERN INDIANA DENTAL ASSOCIATION.

The Eastern Indiana Dental Association will meet at Shelbyville, Ind., May 14-15, 1902. The profession in this and neighboring states are cordially invited to attend.
A. T. WHITE, Sec'y, Newcastle.

IOWA STATE DENTAL SOCIETY.

The annual meeting of the Iowa State Dental Society will be held at Des Moines, May 6-9, 1902. All reputable members of the profession are cordially invited to be present.
I. C. BROWLIE, Sec'y, Ames, Ia.

SOUTHERN WISCONSIN DENTAL ASSOCIATION.

The eighth annual meeting of the Southern Wisconsin Dental Association will be held at Madison, May 14-16, 1902. The executive committee promises a fine program, and a cordial invitation is extended to the entire profession to be present.
J. H. REED, Sec'y, Lancaster, Wis.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

The annual meeting of this organization was held Feb. 15, 1902, at Newark, and the following officers were elected: Pres., J. W. Fisher; V.-P., W. H. Pruden; Sec'y, F. W. Stevens; Treas., Chas. A. Meeker; Ex. Com., C. F. A. Hane, C. W. Hoblitzell, F. E. Riley, W. M. Gould, H. P. Marshall.
F. W. STEVENS, Sec'y, Newark.

WISCONSIN STATE BOARD OF DENTAL EXAMINERS.

A meeting of the Wisconsin State Board of Dental Examiners for the examination of candidates will be held in Madison, at the State Capitol, beginning May 13, 1902, at 9 a. m. Candidates must come prepared with

rubber-dam, gold and instruments to demonstrate their ability in operative dentistry.

H. L. BANZHAF, Sec'y, Manitowoc, Wis.

CONNECTICUT STATE DENTAL ASSOCIATION.

The thirty-eighth annual meeting of the Connecticut State Dental Association will be held at Hartford May 20-21, 1902. At last year's convention over 200 dentists were present. Every effort is being made to have a large and interesting meeting this year, and a large attendance is expected. Exhibitors desiring space will communicate with the Chairman of the Executive Committee, Dr. Geo. O. McLean, Hartford, Conn.

F. HINDSLEY, Sec'y, Bridgeport.

ILLINOIS STATE DENTAL SOCIETY.

The Illinois State Dental Society will meet in annual session at Springfield, Ill., May 13-15, 1902. Every day will be full of good things—practical papers by practical dentists and practical discussions of practical subjects by practical men. Clinics of all kinds, from the filling of deciduous teeth to the most extensive porcelain bridge, with or without saddle, will be given—practically a post-graduate course in dentistry. Every one attending will receive something of real benefit to take home with him.

J. W. CORMANY, Ex. Com., Mt. Carroll.

NATIONAL DENTAL ASSOCIATION, SOUTHERN BRANCH.

The fifth annual meeting of the Southern Branch of the National Dental Association was held at Atlanta, Ga., Feb. 18-21, 1902. The following officers were elected for the ensuing year: Pres., L. G. Noel, Nashville; 1st V.-P., Geo. S. Vann, Gadsden, Ala.; 2d V.-P., W. G. Mason, Tampa, Fla.; 3d V.-P., John R. Beach, Clarksville, Tenn.; Treas. (reelected), B. D. Brabson, Knoxville, Tenn.; Cor. Sec'y (reelected), C. L. Alexander, Charlotte, N. C.; Rec. Sec'y (reelected), S. W. Foster, Atlanta, Ga.; Annual Essayist, J. A. Chapple, Atlanta; Ex. Com., J. E. Chace, Ocala, Fla.; J. P. Gray, Nashville; W. H. Weaver, Lagrange, Ga.

ALABAMA STATE BOARD OF DENTAL EXAMINERS.

The Alabama State Board of Dental Examiners will meet at Tuscaloosa, Ala., May 12, 1902. In addition to the regular written examination there will be the following requirements: Each applicant must fill at least two teeth, approximal cavities, one with gold and the other with alloy, the work to be done under the immediate supervision of the board, and the board to pass upon suitable selection of cavities. The board will try to furnish patients, but failing to do so, applicants for license must find their own subjects and also bring instruments and material. Each applicant must bring an upper denture of not less than eight teeth ready for soldering, hard solder required, which work must be done under the supervision of the board.

T. P. WHITBY, Sec'y, Selma.

SOUTH CAROLINA STATE DENTAL ASSOCIATION AND STATE BOARD OF DENTAL EXAMINERS.

The thirty-second annual meeting of the South Carolina State Dental Association, and the regular meeting of the State Board of Dental Examiners, will be held at Charleston May 18-19, 1902. All dentists residing in the state are invited to be present. Visiting dentists from other states will be cordially welcomed. This will be an excellent opportunity to attend the exposition and to visit the historic "City by the Sea" and spend a few days of pleasure with the dentists of the old Palmetto State.

J. E. BOOZER, Cor. Sec'y, Columbia, S. C.

ILLINOIS STATE BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Illinois State Board of Dental Examiners, to examine applicants for license to practice dentistry in this state, will be held April 30-May 3, 1902, inclusive, at the College of Dentistry, University of Illinois, Harrison and Honore Sts., Chicago. Candidates must furnish their own patients, and also come provided with the necessary instruments, rubber-dam and gold, to perform practical operations and such other work as is deemed advisable by the board. Those desiring to take the examination should matriculate with the secretary at least ten days before the date of meeting. The examination fee is \$10.

J. G. REID, D.D.S., Sec'y, 1006 Champlain Bldg., Chicago.

RESOLUTIONS ON DEATH OF DR. HENRY B. NOBLE.

At a special meeting called for the purpose, the Board of Dental Examiners for the District of Columbia, by unanimous rising vote, adopted the following resolutions:

WHEREAS, Death has suddenly taken from us our most beloved and distinguished associate, Dr. Henry Bliss Noble, and

WHEREAS, In his relations with us he was the soul of honor, always kind, genial, generous and helpful, a man of unselfish disposition, who ever labored to advance the best interests of all, therefore be it

Resolved, That this Board, gratefully cherishing his memory and keenly feeling his loss, desire to spread this expression of their appreciation upon their records.

Resolved, That a copy of these resolutions be transmitted to his family and to the dental journals.

M. F. FINLEY,
C. W. APPLER.
H. J. ALLEN,
J. H. LONDON.

LATEST DENTAL PATENTS.

- 11,956. (Reissue) engine plugger, C. H. Seeger and N. Dedrick, Manitowoc, Wis.
- 689,158. Fastening for artificial teeth, A. Bischoff, Philadelphia.
- 689,539. Dentists' cabinet, W. G. Hullhorst, Toledo, O.

- 690,596. Dental tool, S. W. Platt, Park City, Utah.
- 690,792. Bunsen burner, C. W. Taylor, Sioux.
- 691,092. Air chamber former, L. Arndt, Jersey City, N. J.
- 691,550. Mount for diastoric teeth, H. M. Justl, Philadelphia.
- 691,581. Dental floss holder, A. Baumeister, Hagenau, Germany.
- 691,694. Dental pliers, A. Aderer, et. al., New York.
- 691,695. Dental instrument case, A. Aderer, et. al., New York.
- 691,753. Dental handpiece, F. W. Dean, Des Moines, Ia.
- 691,763. Dental instrument, W. E. Harper, Chicago.
- 692,331. Mouth prop and mirror, W. Hare, Augusta, Ill.
- 692,294. Dental lamp, H. J. Jaeger, New York.
- 692,583. Dental instrument, N. T. Yager, Louisville, Ky.
- 692,708. Toothbrush and powder cabinet, C. T. Price, Washington, D. C.
- 692,713. Dental mandrel, B. Robinson, Philadelphia.
- 693,349. Dentifrice, M. H. Fletcher, Cincinnati, O.
- 693,350. Toothpowder package, M. H. Fletcher, Cincinnati, O.
- 693,384. Artificial tooth-crown, E. Nagy, Budapest, Austria.
- 694,031. Holder for dental devices, J. A. Mead, Corry, Pa.
- 694,526. Chip blowing attachment for engine, W. W. Burgin, Richmond, Ky.
- 694,683. Chair back-rest, G. Sibley, Philadelphia.
- 694,684. Chair head-rest, G. Sibley, Philadelphia.
- 695,092. Dental floss holder, J. W. Gowan, Geneseo, N. Y.

DESIGN.

- 35,776. Dental cabinet, F. E. Case, Canton, Ohio.

IN MEMORIAM.

At the regular meeting of the St. Louis Dental Society, held March 4, 1902, the following report was read and adopted:

Dr. Burt Barry was born July 26, 1871, his parents, Mr. and Mrs. L. T. Barry of Mt. Sterling, Ill., being old settlers in Brown Co. and residing there at the time of his birth. His early education was in the public schools at home and in the military schools at Salina and Orchard Lake.

In 1895 he entered the Missouri Dental College and graduated in the class of 1898. Soon after graduating he opened an office in St. Louis. For the first year he was associated with Dr. W. W. Gardner and the remainder of the time with Dr. G. W. Loesch. During the summer of 1901 he had a severe illness from which he never fully recovered. Later he went to Europe; there he remained long enough to reach the belief that the London climate was best for his health, so decided to live there for at least two years. Making arrangements to that effect, he came back to this country to purchase an American dental outfit for an English dentist with whom he expected to associate, expecting to make the move in March. On his return he spent a short time in his St. Louis office, then went to New York City, and on January 17, 1902, was married in Philadelphia to Miss Marie Peterman, a much esteemed lady of that city. Then he went to Mt. Sterling to visit his parents and friends. There on the morning of February 15 he was found dead in

bed, having died without a struggle to warn his family. His wife was in Philadelphia at the time of his death, but reached Mt. Sterling in time to attend the funeral. His remains were interred in the cemetery on the outskirts of Mt. Sterling on February 18. His wife, parents, one brother and three sisters survive him.

Dr. Barry soon after graduating became a member of our society, and just before his severe illness was preparing a paper on "Dental Materia Medica" to be read before the society.

In college "Burt," as the boys called him, was studious and industrious, aiming to make the best of his opportunities, and he kept up his studious habits after entering practice.

Dr. Barry was prominent in the Jefferson Club during its early history. Personally he was affable, courteous and gentlemanly always, and made friends readily. He was fond of athletics, in several branches of which he was skilled.

JOHN G. HARPER,	} Committee.
F. F. FLETCHER,	
O. H. MANHARD,	

News Summary.

JAMES NOBLES, a dentist at Hawthorne, Fla., died March 9, 1902.

E. B. KELSEY, 48 years old, a dentist at Glen's Fork, Ky., died Feb. 22, 1902.

MORDECAI PRICE, 80 years old, a dentist at Fallston, Md., died March 5, 1902.

P. B. JACOBS, a dentist at Henry, Ill., died suddenly Feb. 12, 1902, from paralysis.

C. P. WILLIAMS, a dentist at Indianapolis, died March 2, 1902, from malarial fever.

J. B. LOUD, 45 years old, a dentist at Cincinnati, O., died from consumption Feb. 24, 1902.

T. J. KEY, a dentist at Eastman, Ga., died suddenly from congestion of the lungs March 1, 1902.

A. W. KINGSLEY, 86 years of age, a dentist at Elizabeth, N. J., died suddenly March 8, 1902.

W. M. SPEAKMAN, 58 years old, a dental dealer at Philadelphia, died Feb. 8, 1902, from paralysis.

M. E. LOVEJOY, 40 years old, a dentist at Mt. Morris, N. Y., died Feb. 12, 1902, from consumption.

W. P. KOOGLE, 39 years old, a dentist at Pemberville, O., died suddenly from erysipelas Feb. 24, 1902.

G. W. EMERSON, 79 years old, a retired dentist at Barnstead, N. H., died Feb. 26, 1902, from heart disease.

J. H. ALEXANDER, 71 years old, a retired dentist at Mystic, Conn., died Feb. 19, 1902, after a long illness.

WHAT "DR." MEANS.—"Dr." is an abbreviation frequently used to express the relation of a patient to his dentist.

BURT BARRY, 31 years old, a dentist at Mt. Sterling, Ill., died very suddenly from heart disease Feb. 15, 1902.

J. L. McQUOWN, who was regimental dentist of the 9th Illinois Infantry during the late war, has been declared insane.

F. I. DIAMOND, a dentist at Philadelphia, graduate of the Philadelphia Dental College, died March 8, 1902, of pneumonia.

C. HOLLINGER, 40 years old, a dentist at Abbottstown, Pa., died suddenly Feb. 23, 1902, from congestion of the lungs and heart disease.

BRIBERY.—A Prussian dentist who is running for office offers to extract free of charge the teeth of all citizens who will vote for him.

CHRISTIAN FENGER, 61 years old, a surgeon of Chicago with a world-wide reputation, died suddenly March 8, 1902, of pleuro-pneumonia.

R. N. HUDSON, 67 years old, and in the active practice of dentistry at Auburn, N. Y., for forty-seven years, died from heart disease Feb. 21, 1902.

WASHINGTON EXAMINING BOARD.—The governor has appointed Dr. Geo. W. Stryker of Everett as a member of the state board of dental examiners.

R. C. MAOKALL, 80 years old, a dentist at Elkton, Md., died Feb. 16, 1902. According to newspaper report he was the first graduate in dentistry in the world.

C. H. BUCKLEY, 33 years old, a dentist at Newburyport, Mass., died from a nervous affection Feb. 20, 1902. He was a graduate of the Philadelphia Dental College.

ODONTOLOGICAL SOCIETY OF WESTERN PENNSYLVANIA elected the following officers on March 13, 1902: Pres., C. B. Bratt; Sec'y, A. Rhinehart; Treas., J. A. Libbey.

C. T. HAWES, 27 years of age, a dentist at Wilmington, N. C., and graduate of the Atlanta Dental College, died from small-pox and pneumonia March 6, 1902.

E. F. STEVENS, 41 years old, a dentist at Medford, Mass., died Feb. 28, 1902, from a complication of diseases. He was a graduate of Harvard University Dental School.

DR. H. J. BURKHART, ex-president of the National Dental Association and active in all society and professional work, was this month elected mayor of his town, Batavia, N. Y.

MISSOURI EXAMINING BOARD.—The governor has appointed Dr. T. R. Hill of Hamilton, as a member of the state board of dental examiners to succeed Dr. R. B. Rice, resigned.

INCOME OF FRENCH PHYSICIANS.—There are in Paris 2,600 physicians, of whom a few have very respectable incomes, but the general average is not above 3,600 francs, about \$700 per annum. The whole country has 16,000 doctors, whose average income is 2,750 francs, about \$550.

NEW DENTAL TERM.—"Dr. Blank, our former dentist, was here Monday. He is now attending to the molars and cuspids of Marion."—*Denton (Ill.) Standard.*

MIDWINTER DENTAL CLINIC.—The third annual midwinter dental clinic was held at San Francisco, Feb. 26, 1902, with 350 dentists in attendance. A very enjoyable and profitable day was spent.

EPITAPH FOR A DENTIST.—The following epitaph has been found on a dentist's tombstone in an English churchyard—"Stranger, approach this tomb with gravity, John Brown is filling his last cavity."

SNOHOMISH COUNTY DENTAL ASSOCIATION.—An organization with this name was formed at Everett, Wash., Feb. 22, 1902: Pres., Dr. Saxe; V.-P., G. W. Stryker; Sec'y. Dr. Gillett; Treas., C. A. Short.

"HIS DENTIST."—Sometimes you hear a man say "my dentist" with such an air of proprietorship that you would never dream he owes the practitioner \$50, which the dental gentleman never expects to get.

HENRY B. NOBLE, 70 years of age, a prominent dentist of Washington, D. C., where he had practised his profession for thirty-five years, died very suddenly from heart disease March 5, 1902, while riding to his office.

WRONG NAME.—"I don't like your heart action," said the doctor, applying the stethoscope again. "You have had some trouble with angina pectoris."

"You're partly right, doctor," sheepishly answered the young man. "Only that ain't her name."—*Exchange.*

QUACK MEDICINES IN GERMANY.—One of the measures adopted in the campaign against charlatany being waged in Germany, is the publication in the medical journals of descriptions of the nature of the most widely advertised quack medicines.—*Jour. A. M. A.*

SOMERVILLE (MASS.) DENTAL SOCIETY.—A society with this name was organized Feb. 10, 1902, and the following officers were elected: Pres., G. L. Marshall; V.-P., G. M. Kingman; Sec'y and Treas., Georgina Crosby; Ex. Com., Geo. L. Marshall, C. E. Parkhurst, W. L. Stevens.

DISCOUNT EXTRAORDINARY.—An article has appeared in several dental journals wherein the writer, a dentist, urges the profession to buy their dental supplies in large quantities, stating that they can be procured "at from 10 to 83½ and sometimes from 50 to 100 per cent discount."

MINT EFFICACIOUS.—It is reported from Waco, Tex., that a seven-year-old child swallowed a silver half-dollar, causing serious symptoms. A physician was called, who promptly administered a little mint. There was an immediate change and before nightfall the child passed five silver dimes.

NEW SPECIES OF PLANT.—Once upon a time, so the story goes, a lady who was a direct lineal descendant of the original Mrs. Malaprop, was wandering through the magnificent conservatory of a Canadian nobleman. Her eye chancing to light upon a blossom which especially attracted her, she remarked: "What a beautiful specimen of the *Diabetes plant*!"

"Yes," answered her host, "it certainly does resemble the sweet pea."

PULLED MAN INSTEAD OF TOOTH.—A man in Kansas who was suffering from toothache started for a dentist's office, but took a few drinks beforehand to brace himself up. By the time he reached the dentist's office he was so hilariously drunk and disorderly that it was necessary to lock him up.

INSURANCE FOR BATHERS.—The latest thing in the line of insurance comes from England, where penny-in-the-slot machines have been established at bathing resorts. Upon dropping a copper coin in the slot before entering the water the bather receives in return a policy good for twenty-four hours.

REPORT YOUR EXPERIENCES.—We should like to have our readers cooperate with each other by reporting their interesting experiences through our columns. At this season dental disorders are usually prevalent, and as a special topic the dental manifestations of la grippe might be profitably discussed.

FINGER-PRINTS AND CRIME.—Mr. Francis Galton has devised a system of identifying criminals by taking an impression of the fingers in india-ink on white paper. He claims that the chance of two finger-prints being identical is less than 1 in 64,000,000, and that these lines are more enduring than any other marks of the body.

NOT A BAD PASSAGE.—A young man calling on his sweetheart for the first time since her return from abroad, inquired about the pleasure of her sea voyage.

"Were you sick both ways"? he asked, solicitously.

"No, I only vomited," demurely replied the maiden.

DAMAGES FOR ALLOWING STUDENTS TO WITNESS OPERATION.—A woman in Grand Rapids, Mich., recently sued a physician for \$5,000 because he allowed medical students to witness an operation which he performed upon her. She was allowed \$75 damages by a circuit court jury. It might be well for demonstrators in dental colleges to make a note of this occurrence.

"YOUR KEY DON'T FIT THIS LOCK," IKEY.—"Vat's de madder, Izzey?"

"I am in great trouble. Ve soldt a man a set of teeth mit a gold plate at four dollars down und two a week. Und he hasn't made de second payment."

"Vy ton't you take de teeth away from him?"

"Ve can't. He's been vaccinated und got de lockjaw."—*Life*.

CLEAN FLASKS.—To prevent black oxids or rust from attacking your flasks, thoroughly clean and wash the flasks in hot, strong soapy water after using. Then dry them well, place together, and set away with screw tops down so that they will be well ventilated, and you will have no trouble in keeping your flasks perfectly clean.—*T. F. Driskill, Corsicana, Tex.*

SCHOOL EXAMINATIONS CAUSE STRIFE.—The dentists of Spokane, Wash., are at war, and the trouble is due to the fact that the Board of Education issued an order that an examining board of nine dentists could examine the teeth of the school children of the city, and further stated, that "some of the most prominent and best dentists of the city will do the work." Those practitioners who are not on the examining board call the move an advertising scheme.

PLATE BREAKS DURING MASTICATION.—A physician reports a case in the *Brooklyn Medical Journal*, where a woman while eating swallowed the central portion of a vulcanite plate, the teeth belonging to same remaining in their proper position on the gums. The piece of vulcanite was removed by external esophagotomy. Did any of our readers ever hear of a similar accident?

MATCH FACTORY EMPLOYEES' TEETH.—The Toledo (O.) Match Co. is having the teeth of all its employes examined, as a protection not only for the employes, but for the company against damage suits. It is of course well known that where the teeth are at all decayed they are peculiarly susceptible to the fumes of phosphorus and other chemicals used in the manufacture of matches.

BLOWS USED IN MALLETING.—Dr. John S. Engs, of Oakland, Cal., reports in the *International* that after the completion of a very large gold filling his patient, a skilled accountant, said he had been keeping a mental record of the number of blows made with the automatic mallet after each pellet of No. $\frac{1}{8}$ gold was put in place. The number ranged from 81 to 50, with an average of 37.

HOME-MADE DENTISTRY.—The versatile correspondent of the *Chicago Inter Ocean* reports that a farmer in Kentucky is using a set of false teeth which he made himself from a piece of apple-tree root with his penknife. The teeth are perfect in shape, and the plate fits his mouth exactly. He can crack corn with this outfit, but report does not state that he can pull nails from two-inch planks, or do anything really remarkable.

SUPPORT YOUR PROFESSIONAL LITERATURE.—Beloved reader, the limited time you have for reading is too valuable to allow you to depend upon stray sample copies and commercial house organs for your professional literature. Select at least three good, up-to-date, enterprising, reliable, scientific dental journals, subscribe for them and read each one thoroughly. We will try to make the *DIGEST* so good that you will choose it as one of the three.

ROBBERIES.—On Feb. 22 a dentist at Milwaukee lost \$15 worth of gold. On March 18 a dentist at Kankakee lost gold to the amount of \$40. On Feb. 28 a dentist in Milwaukee lost \$100 in currency and gold. On Feb. 19 a dentist at Waukegan, Ill., was reported to have lost \$400 worth of gold and other material. On March 9 a dentist at Bakersfield, Cal., lost \$250 worth of tools and gold. On Feb. 8 a dentist at Princeton, Ind., was robbed of \$30 worth of material. In nearly all cases the work was done by sneak thieves and not by professionals.

NERVE.—An Irishman recently went to a doctor, who looked him over and then wrote out a prescription, telling him it would cost about \$1.50 to have it filled. "Have you got that much to loan me, Doctor," asked Pat. At this the doctor took the prescription back and crossed off all the items except aqua pura. "You can get that for 10 cents," he said, handing the paper back to Pat, "and there's the dime." "Don't I have to take those things you crossed off," asked Pat. "No," replied the doctor, "those are nerve tonics, and you don't need them."

CARNEGIE'S EPITAPH.—Our readers are probably familiar with the epitaph which Carnegie wishes placed on his tombstone. It is—"Here lies a man who knew how to get around him much cleverer men than himself." One of our subscribers has juggled the words a little and thinks the result is more suitable for a dentist.—"Here lies a man who knew men much cleverer than himself, who got around him"; and that a little more transposition would make it fit the dead-beat patron—"Here lies a man who knew how to get around much cleverer men than himself."

ILLEGAL PRACTITIONERS.—On Feb. 15 a dental student at Kansas City was arrested for practising dentistry without a license. He had been attending to the practice of a dentist in that city during the latter's absence. Another student at Kansas City was arrested on Feb. 17 for practicing dentistry on his own account. Two dentists at Duluth, Minn., were looked up March 11 for the same offence. It cost two dentists in San Francisco \$50 each on March 6 for failure to have a license. Finally, two dentists at Springfield, Ill., were fined \$35 each on Jan. 23 because they overlooked the little formality of registering.

EASILY SWALLOWED.—"I don't know quite what the lady meant," said the physician, "but whatever it was, she meant it hard. She came to my office last week, and after considering her case I wrote a prescription which was to be put up in capsules of very large size. I explained the reason of this to her and asked if she could swallow anything so big. She looked at me in an acidulous way. 'Swallow it!' she said. 'Why, my husband belongs to two whist clubs and several lodges. Swallow it! Humph! I reckon I haven't been married ten years without learning to swallow bigger things than that.'"—*Washington Post*.

ACCIDENTS.—A dentist at Alton, Ill., on March 4 placed his vulcanizer in a wood stove to heat up. The vulcanizer exploded, blowing the stove all to pieces and setting fire to the house. The dentist was only slightly injured. A gasoline stove exploded in a dentist's laboratory at Watertown, S. D., burning him badly and setting fire to the office, on Feb. 21. On March 5 a vulcanizer in the office of a dentist at St. Joseph, Mich., exploded and wrecked the room. The cover was blown clear through the ceiling. The dentist had a narrow escape, as he had examined the vulcanizer just a moment before and then left the room.

DAMAGE SUITS.—A woman at Oshkosh, Wis., has sued her dentist to recover \$23 which she claims she paid him for a set of teeth that would not fit. A man at Keokuk, Ia., has sued the dental college in that city for \$1,000 damages, claiming that one of the demonstrators of the institution pulled a sound tooth by mistake. A woman in Chicago has brought suit for \$10,000 damages against her dentist. She claims that he broke off a drill in one of her teeth, and she has had the tooth extracted and will exhibit it and the broken drill in court. A woman in St. Louis on March 12 recovered a judgment of \$3,500 against an advertising dental parlor run by three brothers. She claimed that after paying them \$80 to fix up her teeth they knocked her down and kicked her out of doors, and the jury believed her. A woman at

Indianapolis has sued her dentist for \$5,000, claiming that while she was in his office last summer an electric fan fell and permanently injured her.

DENTISTRY VS. MEDICINE.—“I have always looked upon dentistry,” the surgeon was saying, “as a higher branch of the mechanic arts, but it isn’t a profession. What does a dentist do? He works in teeth. He is merely a skilled mechanic.”

“I never could see,” observed the dentist, “why surgery is considered a profession. What does a surgeon do? He works in flesh and bones. He’s a thirty-third degree butcher.”

Whereupon a physician joined them, and both agreed in saying he was nothing more than a glorified hospital nurse.

SUICIDES IN CHICAGO.—According to a Philadelphia newspaper, Chicago is the suicide center of the country. There were 885 suicides here last year, out of a total of 5,840 in the United States. In other words, with one-forty-fifth of the population, we have one-thirteenth of the suicides. Our Philadelphia commentator ascribes this large rate to the “fast and furious” life of the western metropolis. Chicago men ascribe it to the superb healthfulness of their town, as the only chance to escape dying of old age is to take to “sour mash” or carbolic acid. In Philadelphia when a man gets despondent he commences to drink the Schuylkill water. No wonder the death rate is high there.—*Med. Standard.*

DENTIST'S BILL FROM A LAYMAN'S STANDPOINT:—

Did you ever know a bill like a dentist's bill—
 So easy to create and so difficult to kill?
 Steady as the strokes from the hand of Fate,
 Visit after visit doth the sum accumulate—
 And the dentist forgetteth not a solitary date.
 That's the way it goes. If I were in his shoes
 I might be an optimist; now I have the blues,
 For every dividend I draw this fellow has to share—
 “’Tis money makes the mare go,” but he owns the mare.

NO JOB FOR A BOY.—A dentist of our acquaintance is very skillful, but unfortunately is undersized and looks much younger than he really is. Recently two women entered his office, and after looking over him critically for a full minute they mumbled something and abruptly left the room. He was considerably annoyed and more mystified, but he was less mystified and more annoyed when he related the circumstances to a neighboring dentist, who told him the sequel. This was, that two women visited his office and after looking him over, remarked that he “would do.” One of the women then took the chair and stated that she wished a molar extracted. She further remarked that she had “just called on a little sawed-off dentist who did not look strong enough to carry a cane, and who could not possibly have pulled out the teeth.”

DEAFNESS.—Loss of hearing is almost invariably caused by some disease of the throat or nose or both. Recent researches in this direction have demonstrated this fact, and it is now admitted by the more advanced medi-

cal men that, aside from rupture of the eardrum, there is scarcely a symptom of defective hearing which is not traceable directly to the condition of the nose and throat. In view of the new discoveries ear specialists are finding their occupation gone, save as they make their particular branch an assistant in further investigation. It is said that the use of smelling-salts is one of the most prolific causes of deafness, operating by weakening the olfactory nerves, and through them the auditory system. All strong and pungent odors should be avoided as far as possible, especially those which act upon the secretory processes, and "make the nose run."—*Ex.*

LIGHT WANTED ON A DARK SUBJECT.—An old colored man meandered into the dental parlor, accompanied by his daughter, who was suffering from an aching molar.

"Mawnin', boss," began the old man. Ah done fotched dis hyar gal foh ter hab er tooth yanked out, sah."

"All right, uncle," said the dentist. "Shall I give her gas to deaden the pain?"

"What am dat gas gwine ter cost, sah?" queried the venerable African.

"Fifty cents," was the reply.

"Looky hyar, boss, dat am a heap ob money foh to pay out reckless," said the old fellow. "Kain't yo' all gib her er leetle gaserline foh er quartah?"

TEN TIPS ON PERFECT HEALTH.—The *Chicago Tribune* quotes the following from an apocryphal journal, "Beauty Unadorned," which is asserted to be "a periodical of physical culture": 1. Remove wet stockings before going to bed. Damp trotters induce insomnia. 2. Don't talk against the wind. It opens your trap to microbes and icy air. 3. Subscribe for "Beauty Unadorned." 4. Don't go outdoors in your pajamas immediately after exercising. 5. Sleep beside an open window and stick your feet out in the pure air. Heavy bedclothes prevent proper respiration. 6. Never lean against a hot stove. 7. Use cold water when washing your hands. It may not remove the dirt, but it prevents the hands from chapping. 8. If you cannot sleep well in a boiled shirt, buy a nightshirt. 9. Never get up in the middle of the night to buy a drink without wrapping up warm. 10. Don't wake up the bartender if you haven't the price.

SUPRARENAL EXTRACT AS AN ANTIDOTE FOR CHLOROFORM.—Dr. T. G. Brodie (*Brit. Med. Jour.*, Nov. 23, 1901), demonstrated a method by which the total work performed by the heart of an animal could be determined before and after the administration of a drug. The work was ascertained by recording the total output of the heart, made to discharge into an automatically working Stromuhr, under a pressure maintained constant by a second piece of apparatus. The total work was the product of the output multiplied by the mean pressure. Anesthetics had until then been chiefly studied. Chloroform markedly depressed the working capacity; ether, on the other hand, had but little effect unless given in very large doses. Ethylen chlorid had only a slight action. Adrenalin chlorid greatly increased the rate of the beat, and largely augmented the work performed. It was an antidote to chloroform. If administered first the heart withstood much

larger doses of the anesthetic, while a heart greatly depressed by chloroform recovered completely when adrenalin was introduced.

SYPHILIS OF THE LYMPHOID TISSUE IN THE BASE OF THE TONGUE—Dr. G. Hudson Makuen reports (*Jour. Am. Med. Assn.*) a case in which the tertiary manifestations were confined entirely to this tissue, and Dr. Casselberry in opening a discussion upon a paper which was read at the last meeting of the American Medical Association mentioned a similar case in which, from a mistaken microscopical examination, a large mass had been removed after pharyngotomy, under the supposition that it was a case of carcinoma. Dr. Stout of Philadelphia referred to a case in a trained nurse who had caught the original infection by sucking milk from an abscessed breast.

LIFE LENGTHENING.—It is estimated that the life of humanity has gained 25 per cent all the world over in the last fifty years. The lowest average that has been calculated is twenty-three years, which represents the life expectancy of the Soudanes; but even this is high when it is remembered that in Geneva in the thirteenth century fourteen years were all that were allotted to man. The United States Census in 1850 shows that 7.47 per cent of the persons who died in the previous decade were over seventy years of age; in 1860 the percentage was 7.54, and in 1880 it was 10.35. The deaths of adults have diminished in a continuous ratio, so that the proportion of infant victims to the whole number of deaths is constantly on the increase. In the United States the average longevity is fifty-five years. In England it is about forty-eight. In France during the past half century the average has gone up from thirty-eight to forty-five and one-half years.

FOOD IN THE PHARYNX.—Dr. Ed. Lavel reports four cases of suffocation following the ingestion of large morsels of food which have reached the pharynx only (*Bulletin Med.*) Two of these patients died before aid arrived. In the other two large pieces of food were rapidly removed. As a rule such bits of food lodge just at the entrance of the larynx, in the esophagus, or they may enter the larynx. In either case they occlude the respiratory passages. The food is generally a piece of insufficiently masticated meat. Suffocation occurs at once, and either dyspnea persists until help arrives, or asphyxia supervenes instantaneously. The diagnosis is easy. Prophylactically all food should be well masticated. Tracheotomy or rythmical traction of the tongue may be performed at once. The physician tries to dislodge the piece of food with his finger or a forceps. The laryngoscope will help to locate the occluding body.

DISEASES OF THE MAXILLARY ANTRUM.—Dr. W. E. Casselberry of Chicago reports two cases of serious disease of the maxillary antrum (*Laryngoscope*) and discusses the subject in its general aspects, giving a bibliography of its literature. He concludes that the diagnosis of accumulation of serum in the antrum without its distention or deformity must be based upon aspiration, the transillumination test being indecisive. The discrimination of a free collection of serum from a cyst may be quite impracticable, even when the sinus has been widely opened, and sometimes it has been impossible to determine the point even on autopsy. The treatment may consist in removing

any polypi, resecting enlarged middle turbinated bodies, removing any other obstruction of the opening of the orifice of the sinus, with due perforation for drainage. Should this fail, an opening in the anterior wall of the sinus should be made sufficiently large for palpation, and then curetting would seem to promise a cure and perhaps forestall what would ultimately become an empyema.

"XEROSTOMY"—DRYNESS OF THE MOUTH.—A. Thioly-Regard before the Swiss Odontological Society describes under the name of "xerostomy" an abnormal dryness of the oral mucous membrane. He quotes Dr. Kirstiny, who has made an exhaustive study of this pathological condition. The principal symptom of this disease is an excessive dryness of the mouth due to the absence of salivary secretion, but this condition does not necessarily imply a complete arrest of salivary secretion. The absence of saliva brings about a rapid disintegration of the teeth from carious invasion. Affliction, pain and fever are also predominant symptoms of this affection. The treatment has not been discussed, and we are in the dark as to the best means of combating this malady. Dr. Thioly-Regard affirmed that the dryness of the mouth can be caused by the use of prosthetic appliances, which in certain persons of peculiar idiosyncrasy cause intense thirst accompanied with fever. This would be caused by nervous fatigue and by the pressure of the plate against certain terminal nerve-fibers, which in turn would bring about reflex glandular disorders. Several cases of this nature have already been described, among them some by Drs. Delphin and Bardet.—*Schweizer Viertel. für Zahn.*

NEW BONE FROM PERIOSTEUM.—J. H. Branth gives the histories of one or two cases illustrative of the fact named in the title of his paper. He says that injuries to the periosteum will often cause a necrotic condition of the underlying bone of more or less depth until the inflammatory condition and its walls form a barrier against further invasion. Quietude and healing in the part do not set in until the dead matter is ousted from the body; the dead matter, having reached the surface of the bone, often finds an especial resistance in the periosteum, and as a consequence the periosteum, besides becoming involved in the inflammatory process, is then dissected up farther from the underlying bone by the pressure of the abscess matter. Now, more bone surface is denuded and deprived of one source of nutrition, that of the periosteum, and the pyogenic germs find less resistance in the half-starved living part, the *locus minoris resistentiæ*, and more or less of the bone is involved before the inflammatory process can make its way out through the periosteum, which latter has the greater vitality. In this way it may occur that, after necrosis of a part of a bone, the periosteum, having been lifted off the bone, may deposit osseous cells on its lower surface and so build a bridge, as it were, over the necrotic substance for some distance, while at some small outlet the *debris* makes and finds its exit. The internal dead bone is the sequestrum and the newly formed bone is the involucrum. Such a condition will not permit healing until the sequestrum is removed, which Nature alone accomplishes by a slow disorganization into *debris* until it is removed through the avenues of exit.—*N. Y. Med. Jour.*

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No. 4.

Original Contributions.

THE HEAD OF DEGENERATES.

BY WILLIAM C. KRAUSS, B.S., M.D., BUFFALO, N. Y., CONSULTING NEUROLOGIST BUFFALO GENERAL HOSPITAL, PROVIDENCE RETREAT, ATTENDING NEUROLOGIST ERIE COUNTY, GERMAN, GERMAN DEACONESS, AND WOMAN'S HOSPITALS. READ BEFORE THE BUFFALO SOCIETY OF NATURAL SCIENCES, SPRING SESSION, 1901.

In reviewing the symptoms of degeneracy offered by the head, I shall consider the skull, face, hard and soft palates, and teeth only, prefacing this delineation by a few remarks on what degeneracy means and what is foreign to it.

In pathology degeneration means the substitution of a tissue by some other regarded as less highly organized, less complex in structure, of inferior physiological rank, or less suited for the performance of the original function. The same definition may apply equally well in human ontogeny, where we can regard a normal man as possessing a certain number of units of strength capable of supplying or exerting a certain number of units of work or force, varying of course according to the environment, education and fixity of purpose of the individual. It would be obviously unfair to compare a professional man or a brain-worker, whose units of work are intuitively manifold more than a hand-worker, and declare the latter a degenerate, because his force and energy as measured by the world's standard are not as productive as the former. The questions of money standard and time-worth are foreign to the laws of degeneracy and are not to be considered in any way. The degenerate must be considered solely and alone upon the physical, mental and moral stigmata which brand him as an abnormal or atypical man, and prevent him from exerting himself to the highest limit commensurate with his skill and development.

The Skull.—The skull has been the subject of anthropological research for many years, each investigator endeavoring to formulate

certain laws which shall be useful in distinguishing racial characteristics or in aiding the criminologist and expert in deciding upon the degree of responsibility or irresponsibility of the indicted or suspected transgressor. As yet their labors have not borne the desired results, as cranial deformities and dissimilarities are present in races, tribes, and even in members of the same families.

The normal head, so-called, is judged by the ratio which the length of the head bears to the width, when viewed from above. The antero-posterior is to the bi-parietal diameter as 100 is to x is the formula for determining the cephalic index. All length-breadth indices below 78 are considered dolichocephalic; 78 to 80, mesocephalic, and above 80, brachycephalic. All indices between 70 and 90 may be considered physiological variations. The physiological variations dependent upon age, and the artificial deformities as practiced by the Polynesians and the Indians of North and South America, must not be included among the irregular types.

The dolichocephalic or long-headed races are the English, Irish, Scandinavians and Negroes, with an index of 73; Arabs, 74; Chinese, 76. The brachycephalic or broad-headed are the Germans, Russians and Turks, with an index of 81, while the mesocephalic or mediums are the American Indians, Hollanders and Parisians, with an index of 79.

Virchow has given us a very complete classification of the deformities of the skull, based upon the observation that premature synostosis of a suture produces a shortness of the diameter, perpendicular on the direction of the obliterated suture; the bone stops growing prematurely where the synostosis has occurred, whereas the non-affected borders continue growing. Virchow's classification is as follows: I.—Simple macrocephalus. 1. Hydrocephalus. 2. Keph-alones without hydrocephalus (or simply enlargement of the skull).

II.—Simple microcephalus. The average circumference of an adult male skull is 52 centimeters, female, 50 cm., the physiological variations ranging from 48.5 cm. to 57.4 cm. The macrocephalic skull, which in the large majority of cases is due to hydrocephalus, may be the result of a tubercular meningitis, or of obstruction of the venae Galeni, or, as is usually the case, of fetal development and often hereditary.

Microcephalus is due to early ossification of the sutures and fontanelles, and is frequently productive of idiocy, epilepsy, cretinism

and other degenerative neuroses. The causes of early ossification may be rachitis, or insufficient nutrition of the cranial bones from early obliteration of the nutrient vessels, or lack of development of the bony tissue from inhibition due to inflammatory changes in the sutures.

True microcephaly demands a bilateral and symmetrical lack of development of the entire skull. If the vertex of the skull is undeveloped whilst the basal bones attain their proper size, the Aztec type of microcephaly results. Another rather rare form of microcephaly results when the small skull with thick bones, and synostosis at the vertex, has the basal bones remaining cartilaginous; the petrous bone and the ethmoid are larger than normal, while the cerebellar fossa is unusually large; the cerebellum, pons and spinal cord develop to the detriment of the cerebrum, which remains illy developed. Griesenger compares these idiots to birds, with their long-pointed and beaked nose and small, low and short heads.

The degenerative tendency of microcephalics is well illustrated in a case published by me in the *Journal of Nervous and Mental Disease*, July, 1892. The head measurements of this woman, possessing limited intelligence, age 27 years, 4 feet 11 inches in height and of 110 pounds weight, were as follows: Circumference, 48 cm.; occipito-frontal diameter, 14 cm.; bitemporal diameter, 13 cm.; biparietal diameter, 13 cm.; occipito-mental diameter, $20\frac{1}{2}$ cm.; suboccipito bregmatic diameter, 16 cm. Married in 1884, she had given birth to five children, all of whom were microcephalic at birth. During dentition three of them became macrocephalic, undoubtedly hydrocephalic, dying of meningitis, and two died of convulsions, the head remaining microcephalic.

III.—Dolichocephalus. 1. Upper middle synostosis. Simple dolichocephalus (or long head), the result of synostosis of the sagittal suture. Sphenocephalus (or wedge-shaped head) is due to synostosis of the sagittal suture with compensatory growth in the region of the large fontanelle. 2. Inferior lateral synostosis. Leptocephalus (or narrow head), the result of synostosis of the frontal and sphenoid bones. Klinocephalus, synostosis of the parietal and sphenoid bones.

IV.—Brachycephalus. 1. Posterior synostosis. Paracephalus (or thick-skulled), the result of synostosis of the parietal bones with the occipital bones. Oxycephalus (or steeple head), produced by

synostosis of the parietal bones with the occipital and temporal bones, with compensatory growth of the region of the anterior fontanelle. 2. Upper anterior and lateral synostosis. Platycephalus (or flat head), produced by extensive synostosis of the frontal and parietal bones. Trochocephalus (or round head), the result of partial synostosis of the frontal and parietal bones in the middle of the half of the coronal suture. Plagiocephalus (twisted head), or oblique deformity of the head, due to the unilateral synostosis of the frontal and parietal bones. 3. Inferior median synostosis. Simple brachycephalus (or broad head), the result of early synostosis of the basal and sphenoid bones.

Besides these cranial deformities there is still another common type recognized by many observers as the trigonocephalus (or triangle-shaped head), caused by the premature union of the frontal suture. Characteristic of this deformity is the very narrow forehead corresponding to the vertex of a triangle, while the diverging sides of the cranium, terminating in a wide, flat occiput, correspond to the base of the triangle. An interesting example of this kind came under my notice about two years ago in a paranoiac, who shot down the center of a supposed conspiracy which, as he thought, was directed against his mother. Besides other marks of degeneracy the cranium possessed the well-marked characteristics of trigonocephaly.

In addition to these well-known types of cranial deformity there are other stigmata which occur occasionally in the crania of degenerates, consisting in abnormally high or low development of certain arcs or diameters, prominent among these being the empirical greatest height of the head or the distance between the basion and vertex of the skull, the bifrontal arc, and the biparietal arc.

The proportion of the length of the cerebral chamber to the basi-cranial axis (as 100) may rise to 270 in the higher and sink to 230 in the lower races. (Huxley.) Expressed in centimeters, this height or basi-cranial axis averages 13.3 in men, 12.3 in women, and the physiological variation is from 11.5 to 15 cm.

The naso-bregmatic or frontal arc, or the line from the root of the nose to the bregma, expressing a high, or low, or receding forehead, averages 12.5 cm. in men, 12 in women, with a physiological variation between 10.9 and 14.9 cm.

The bregmato-lambdoid or parietal arc, corresponding to the

length of the sagittal suture, averages 12.5 cm. in men, 12 in women, with a physiological variation between 9.1 and 14.4 cm. (Peterson.)

Minimal measurements of the frontal arc are oftener found in the insane and criminals; the parietal arc is also said to be often shorter in the insane, defective and delinquent classes and in epileptics. In these classes, however, maximal excesses also often occur. (Dana.) Of 127 measurements made by Zucker-Kundler upon insane subjects, 103 showed a typical variation, or more than 81 per cent. Wilson, from measurements of the heads of 464 criminals, finds that the anterior portions are poorly developed and that the cranial deficiency is associated with real physical deterioration. Forty per cent are invalids, and a still larger proportion of these are professional thieves. Asymmetry, though often existing in normal subjects, is much more constant and pronounced in the criminal and is frequently a characteristic mark of his family and descendants.

Skulls that are below the normal type in volume belong to abnormal individuals, especially the insane and criminals. A marked deficiency in any portion of the skull leads to the conclusion that the part of the brain subjacent to it is imperfectly developed. Voisin says that the proper exercise of the intellectual faculties is impossible with a head whose circumference measures from 28 to 33 cm. or less, and in which the naso-occipital arc measures from 210 to 213 cm. or less.

Since lack of symmetry exists between the two sides of the body, so, too, in the skull of normally developed individuals we find variations in the size of the two halves of the cranium. As a rule the left side of the head presides over the right side of the body; and as the right side of the body is usually more fully developed than the left, and muscular strength is generally in excess on that side, it would seem to follow that the left side of the head should present the largest contour. This proves to be the case, the left side being larger than the right in the proportion of three to one. As Brown-Séquard has demonstrated, the left lobe of the brain comes into greater use in its control of the right side of the body than does the right lobe in its control of the left side. Unequal muscular and cerebral development bears a relation also.

From a careful study and analysis of the cranial deformities and

aberrations, it is generally admitted: 1. That no special type or types of cranial deformity or irregularity have as yet been found pathognomonic of any class or classes of degenerates. 2. That wide variations do occur in the normally developed and well-balanced individuals. 3. But it must also be admitted that along with other physical, mental and moral stigmata, these cranial variations are significant and important and are of the greatest value to the anthropologist and criminologist.

The Face.—The face as a whole has been regarded for centuries as portraying the underlying deep-seated nature of the individual, and in every-day life is the mirror which reveals the sagacity, honesty and good-will of its bearer. Its expressions have been as carefully studied as have been the emotions which give rise to them, but as yet no scientific study has been made of them.

As marks of degeneration we do consider asymmetries in the two sides of the face; unequal innervation of the facial muscles of the two sides; squints and tics of the facial muscles; a depression over the glabella, as observed in epileptics, due to over-action of the corrugators; the Lemurian hypophysis or abnormal development of the masticatory muscles, as described by Albrecht. Not to be included in these anomalies is the affection known as Hemiatrophia facialis, or atrophy of one-half of the face, right or left side, due to some lesion, probably of the trigeminus.

Of greater significance and importance is the slope of the face or the cranio-facial angle, which in the different races of mankind and in man degenerate presents wide variations. A line drawn from the anterior extremity of the premaxilla to the anterior extremity of the basi-cranial axis may be taken to represent the facial axis, and the angle included between these two is the cranio-facial angle. It varies with the extent to which the face lies in front of or below the anterior end of the cranium, from less than 90° to 120° . (Huxley.) Francotte gives the average for European races as 62° to 80° . When it is great the face is prognathous; medium, opisthognathous; small, orthognathous. Every normal face presents this subnasal prognathism, but when extreme prognathism or orthognathism is met with the condition is pathological. Excessive prognathism is found among criminals and microcephalics. Lombroso in an examination of 40 criminals found only three whose facial angle was 80° to 81° , while in the other 37 it ranged from 68° to 74° . In 60

criminals quoted by Francotte, the facial angle of the various offenders was as follows:

	Maximum.	Minimum.	Medium.
Poisoners	80	75	76.2
Offenders	78	75	76
Incendiaries	79	71	75
Robbers	78	72	74.9
Infanticides	79	70	74.9
Assassins	77	71	74.3
Murderers	81	69	72.9
Violators	73	72.5	72.7
Prostitutes	73	70	71

A secondary condition is the form of the alveolar portion of the upper jaw, which so far as it is vertical tends towards orthognathism, but so far as it is oblique and produced tends to prognathism.

The mental prominence in the higher races as a rule projects beyond the line of the vertical alveolar margin of the mandible. In the lower races and in many degenerates it is greatly inclined forwards, the lower teeth projecting beyond the upper, making the inferior maxillary angle very obtuse. This condition is due to defective development of the posterior parts of the skull, breadth of the parietal and temporal bones, and aplasia of the superior or hyperplasia of the inferior maxillary bones.

Gurrieri found from a comparison of normal crania and jaws with those of the insane and criminals, that the weight of the normal cranium is less than that of the insane, and the latter less than that of the criminal, and that the mandible follows to a slightly more pronounced degree the same law.

Hard Palate.—The deformities of the hard palate have been carefully studied by Peterson, whose observations in this direction extended over a period of eleven years, and comprised examinations on upwards of one thousand persons (100 criminals, 600 idiots, and 500 neuropaths of other kinds.) On account of the frequent mention of the Gothic palate, he had adopted an architectural nomenclature in the following classification which he offered. Pathological Palates.—“(a) Palate with Gothic arch; (b) palate with horseshoe arch; (c) the dome-shaped palate; (d) the flat-roofed palate; (e) the hip-roofed palate; (f) the asymmetrical palate, and (g) the torus palatinus. The seven varieties are to be

looked upon merely as types. Each type presents variations and combinations with other forms. Among the flat-roofed palates would be included all such as are nearly horizontal in outline, as well as those with inclined roof sides but flattened tables. In the hip-roofed palate there is a marked pitch of the palate roof in front and behind. It is usual to find asymmetry of the face and skull in cases with an asymmetrical palate. The *torus palatinus* (Latin *torus*, swelling) was first mentioned by Chassignac as a medio-palantine exostosis. It is a projecting ridge or swelling along the palatine suture, sometimes in its whole length. It is always congenital, and varies considerably in both shape and size. But two or three cleft palates were found among the many idiots examined, and as a number of such palates had been found in subjects who were far from being degenerated, it was not thought proper to include the cleft palate among the well-marked stigmata of degeneration."

The arch formed by the teeth or alveolar margin is in the most orthognathous races wide and evenly rounded, while in the most prognathous it is prolonged and its sides are nearly parallel. (Huxley.) Asymmetrical, saddle-shaped, triangular-shaped arches are also often observed in the degenerate.

Soft Palate.—The uvula has been the subject of careful study of late, especially by Dana, who examined it in regard to shape, size and innervation in 108 insane, 60 neuropathic and 155 sane, a total of 323 in all. He found that in the insane the total number of deformities of all kinds was 53, the most common peculiarity being a twist to one side, generally to the left. The proportion was much greater in the degenerative forms of insanity, showing that just in proportion as the physical stigmata of degeneracy were more marked did the proportion of deformed uvulæ increase. Dana concludes "that the existence of a uvula twisted to one side and not innervated forms an anatomical and physiological stigma of degeneration. The twist or bend implies an unequal development of nerve supply of the two sides, and the degenerate uvula is one that has an unequal and defective nerve supply. Touch the throats of degenerates and in more than half of them the azygos muscle makes no response.

The Teeth.—The abnormalities of the teeth and of dentition observable among the degenerates are briefly as follows: 1. The notched teeth of congenital syphilis or Hutchinson's teeth, particu-

larly well marked in the upper central incisors. 2. Persistence of the temporary teeth, especially the cuspids. 3. Abnormal length of the cuspids. 4. Abnormalities in the slope of the teeth. 5. Abnormalities and irregularities in the position of the teeth. 6. Rachitic teeth. 7. The teeth of extreme prognathous races and individuals are much larger than normal; the roots of the premolars and molars are more distinct, and the last molars not so small relatively to the others. This is observed especially in the lower races, notably the Australians.

APPROXIMAL FILLINGS IN BICUSPIDS AND MOLARS.

BY GEO. H. GREEN, D.D.S., DANVILLE, KY. READ BEFORE THE KENTUCKY STATE DENTAL ASSOCIATION, MAY 14-16, 1901.

The only apology I have to offer for writing on so hackneyed a subject is the fact that the principles which I shall offer are almost universally disregarded by operators. I wish to discuss the outline and contour of approximal filling in bicuspids and molars, relative to the restoration and preservation of the interproximal space and adjacent tissues. The illustrations which I have prepared are patterned to a considerable extent after those of Dr. C. N. Johnson, which appeared in an article entitled "A Few Considerations in Filling Teeth."

Every observant dentist must have noticed that the margins of well filled cavities on the occluding surfaces of teeth are seldom subject to the recurrence of decay, owing to the cleansing effect of mastication, which does not permit of the retention of food for a sufficient length of time to permit of the formation of tooth-destroying products. The same immunity is observed at the buccal margins of approximal fillings, when those margins extend sufficiently beyond the point of tooth contact to allow of proper cleansing with the brush.

It is a common cause of chagrin to dentists to find such fillings as the last described falling after a few years along the lingual or cervical margins, which are concealed by the approximation of the adjoining tooth, especially as the coronal and buccal aspects show a lasting piece of work. When this happens the inartistic process of patching is necessary to replace the carious area, or the entire filling may have to be removed and a new one inserted.

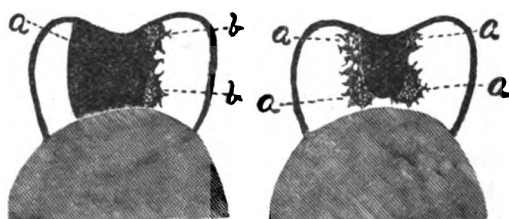
In Fig. 1 we have the approximal face of a molar filled as above.

From a mechanical standpoint the filling may have been perfect when complete. We see the buccal margin (a) clean and intact, but the lingual margin fails where it is impossible to thoroughly cleanse it because of the contact of the adjoining tooth. Food has lodged and disintegrated, microorganisms have found a fertile field of operation, the tooth structure has become impaired, and decay has occurred along the entire wall of the former cavity, with the result as seen (b—b).

In Fig. 2 we have one of the most common forms of compound approximal fillings, the conditions on both sides and at the cervical margin of which are identical with the lingual margin of Fig. 1.

Fig 1

Fig 2



The question naturally arises—why is one margin of the filling free from caries, and how can we insert a filling and insure immunity to all the margins? Just as naturally the answer comes—extend the margins so as to bring them sufficiently without the area of contact that free and easy cleansing may be possible. What, however, concerning the cervical margin, as it in no case can be reached with the brush and few of our patients can be trained to use the floss silk with regularity? I should suggest that the cavity be extended to the gum margin or even slightly below its free edge, and at this point be broadened to such a degree that all parts of the filling not exposed to the action of natural and artificial cleansing shall be protected by a covering of gum tissue. This is commonly known to possess a conservative power, probably because of the antiseptic character of the secretions of its superficial glands. The proof of this lies in the fact that caries seldom occurs below the gum margin, unless it has its origin above the line and extends be-

low it. In this event the destructive process will continue without limit, as the gum exudation is not germicidal.

Let us now consider the interproximal space and the gum septum. In Fig. 3 we have the buccal view of a bicuspid and molar, on the approximal surfaces of which no decay has taken place. Below the point of contact we see the V-shaped interproximal space almost filled with gum tissue, which is the normal condition. The gum arches up toward the apex of the interproximal V, leaving a slight space between the crest of the arch and the point of tooth contact. During the process of mastication any food which may pass below the grinding surface slips down the smooth rounded surface of the

Fig 3

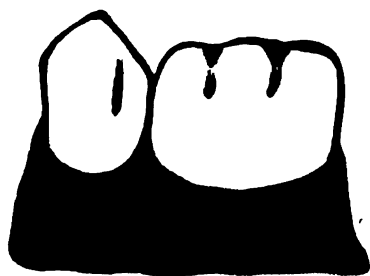


Fig 4



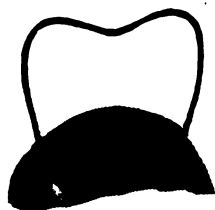
gum festoon, the apex being protected from the packing of food by the close approximating contour of both teeth at the point of contact. Nothing passes into the small space below excepting a few shreds of meat or other fibrous substance, and these are usually dragged away on one side or the other by the passing of fresh food or the tongue. After the meal anything remaining can be easily dislodged. Thus under normal conditions the gum tissue filling the interproximal space is amply protected by nature.

However, as shown in Fig. 4, when the approximal surfaces have been extensively attacked by caries, and the natural contour of the teeth has been lost, the latter being deprived of their natural support, move together, as they invariably do in a full arch, and the interproximal space is partially or entirely obliterated. As decay progresses the cervical margins of the cavities in both teeth come nearer together, and gradually these approximating margins extend

rootwise, and we find the gum septum continually crowded down until the buccal and lingual aspects assume the positions shown in Fig. 4.

Fig 5 is a view of the approximal surface of a molar, showing the normal arch of the gum septum. In Fig. 6 we have the same tooth with an extensive area of decay extending below the gum margin, with the result that the normal curve has been reversed, and instead of an arch we have a depression. Usually inflammation is present to a greater or less degree.

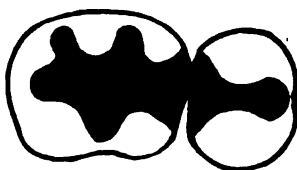
What method shall we now pursue to restore the teeth and soft tissues to a healthy condition? If a thin file should be passed be-

Fig 5*Fig 6*

tween the teeth, the frail margins chiseled away, and fillings inserted, two broad, flat surfaces would be the result. Such fillings would not protect the soft tissue beneath, their shape would invite the passage of food down between them, and continued mastication would mean continued packing and pressure until the pain became unendurable. In less extreme cases these unsatisfactory fillings would fail along the cervical margins after a short time. The logical method is to restore the teeth and gums as nearly as possible to their original shape and condition. To do this the first step is to force the teeth apart until they stand in their former normal positions, and then the original contour must be restored, a cross section of which is shown in Fig. 7. Many operators advocate filling both cavities and the intervening space with a solid mass, leaving no space between. I have never found this advisable except where there is a tendency, because of there being no tooth beyond one or the other so treated, to further separation, and even this can usu-

ally be overcome by extending the occlusal surfaces of the fillings so that they are almost continuous, and leave no V-shaped space above into which the food can wedge. Where the contour has been judiciously fashioned, the approximal surfaces properly smoothed and polished, and all rough or overhanging edges at the cervical margin removed—except where there is atrophy or disease of the gums—the gum septum will in a short time almost if not entirely again fill the original space which has been recreated by the separation and contour. Thus, to sum up the whole paper in one sentence, with the proper contour and finish, and with sufficient extending of the cavity to bring the lateral margins within easy reach of the brush, and the cervical margins below the free edge of the gum septum, the original conditions will be nearly restored, and the adjacent tooth structure will be peculiarly free from the recurrent decay.

Fig 7



Since writing this paper I have read the *May Items*, which is almost entirely given up to a discussion of one of the points which I brought out. Dr. Ottolengui attacks the position taken by Black and Johnson in extending approximal cavities rootwise until they reach below the free margin of the gum. Eight prominent men write papers on the subject, four for and four against Black's and Johnson's view. I may be prejudiced, but it seems to me that the side defending the method that I hold offers by far the better argument. Since reading this symposium I have not altered my paper, but I realize after reading the argument on one point that I have probably laid myself liable to criticism by failing to qualify one statement. I do not advocate extending all approximal cavities rootwise until the gum margin is passed, regardless of distance or condition, for there must of course be exceptions to all rules. Let me quote from Dr. Johnson—"But in those cases where there has

been an extensive and permanent recession of the gum, so that there is an appreciable distance between the decayed cavity and the gum margin, it would be folly to attempt to cut through sound tissue to the extent of two or three millimeters for the purpose of carrying the filling under the remaining gum. It is a question of judgment with this, as with other matters calling for discrimination in different cases, but the principle of protection to the gingival margin of the filling should never be ignored."

Discussion. *Dr. C. G. Edwards*, Louisville: Non-cohesive gold has given away to cohesive for the restoration of contour. In these cases the preparation of the gingival margin is important, as we find it gives way even where there is no decay, and not only that, but the alveolar process and bony septum are absorbed. The recurrence of decay is not always due to a lack of preparation of the border of the cavity.

Dr. Max N. Eble, Louisville: The truth of the substance of this paper will certainly be admitted by all. Excessive contour is important, and our patients must be impressed with the fact that it is necessary to separate the teeth in order to properly restore the contour. A filling such as Fig. 2 is worth twice as much as an ordinary one. When we cut beyond the decay more contour must be supplied, but many operators do not follow out this idea simply because it is not remunerative.

Dr. B. Oscar Doyle, Louisville: I make the restoration with alloy and finish with gold, thus saving considerable expense.

Dr. J. W. Clark, Louisville: I fill these cavities with a combination of amalgam and gold, using the former at the cervical border and building up the upper two-thirds with gold.

Dr. H. B. Tileston, Louisville: Where the cavity is prepared as Dr. Green has indicated, and where the filling is well put in, caries is not likely to recur no matter what material is used. In the extension of cavity margins for prevention there are certain limitations, such as sensitiveness of dentin, nervousness of patient, and perhaps lack of time, but I do not believe we are justified in doing anything less than what we know to be right simply because the patient cannot afford to pay the fee to which we feel entitled. Malpractice would hardly be justified on the plea that the patient could not pay the fee demanded.

Dr. Henry Pirtle, Louisville: I remember a case where I re-

stored the contour and the patient afterwards complained that the tooth felt too tight. The mouth was not overly crowded, and in preparing the cavity I did not separate the teeth, but restored the contour with a metal matrix at one sitting. I was careful to finish the margins under the gum and to bring out the convex surface. Upon the patient's continued complaint I ran a file in and cut off part of the filling, which relieved the trouble.

Dr. O. G. Wilson, Franklin, Ky.: In filling bicuspid and molars I use a matrix, and then with a small spoon excavator scrape the edge of the cavity and bevel the margin outward. I do not believe that gold is the only agent for saving teeth, as I have found "Fellowship" alloy a very good filling material. The margins of a cavity prepared thus are filled with this alloy with exaggerated contour, and after the filling is in place the margins may be nicely finished.

POPULAR DENTAL EDUCATION.

BY H. VAN ANTWERP, D.D.S., MT. STERLING, KY READ BEFORE THE
KENTUCKY STATE DENTAL ASSOCIATION, MAY 14-16, 1901.

In casting about for a subject I have chosen one which has always been of great interest to me. One which is old, too, to this Association, for I remember when a boy seeing the cards of "Instruction to Parents" issued by this body, and generally distributed by its members in their daily practice. Believing the subject to have been somewhat neglected of late, I shall attempt to present to you a few thoughts, with the hope that they may prove stimulating and of possible profit. Just here I should like to touch upon a rather perverted view of this subject that is often presented. Whether the proposition be labelled—"A Dentist's Relation to his Patients," "Our Profession and the Laity," "Our Relation to Medicine and M.D.'s," "The Public's Opinion of Us," or what not, properly paraphrased the question really reads—"How May We Better Hypnotize the Public, that We May Occupy a More Exalted Position in Their Estimation and More Easily Extract the Desired Rocks from Their More Willing Pockets." We have heard much fruitless discussion and effort of this sort, and pondered on how far wide of the mark it all was and what a woeful waste of gray matter and foolscap. As dentists—not stomatologists—we should be too busy with the demands and responsibilities of each day to worry over any prestige

or preferment that any other profession may *seem* to possess over our own. I regard our profession as a specialty of medicine, rather highly developed along artistic and technical lines, and with more or less of a mechanical basis; one that in its nature and practice needs no defense nor apology. True, the medical profession has much that is of help to us, but we, reciprocally, more that would be of help to the general practitioner or surgeon, if he had it. We so often see the suggestion that the dentist ought to be a graduate of medicine; but of how much greater benefit to the M.D. and his patients would be a course for him in some good dental college; and nowhere else could the surgeon acquire so perfectly that delicacy of touch and exact skill so necessary to his success.

As dentists we rarely, except in the bosoms of our own families, are present at the ushering in of new members of the clan Adam or the passing away of the old; we seldom in our professional capacity touch or are concerned in the great physical crises and emergencies that involve the lives of those about us; rarely weighing vitality (aided or handicapped by our skill) against disease, and having a whole community hanging on our decision. We infrequently conduct a case more serious than a fractured jaw or an abscessed antrum, and as a profession we may perhaps not deserve to be taken so seriously as our medical friends. But as *men* we are on the same footing, and it is our privilege to earn and retain, if we will, the wholesale respect and even veneration of those about us, and thus by our character and personality strengthen and build up our profession in the esteem of our fellow men. Why then waste time in discussing the position of dentistry in the eyes of the public as compared with medicine. Had we not better devote all our energies to filling our place here in a thoroughly capable and conscientious manner, thinking not of what others think of us, but only to know that our lives are clean and upright, and that our professional knowledge and skill are as great as is individually possible with us. We should remember that "We can be valued only as we make ourselves valuable"; and that if we would aspire to eminent success and the esteem of our fellowmen we must be actuated by the spirit of Addison's lines—

"Tis not in mortals to command success—
We'll do more, Sempronius, we'll deserve it."

But to the subject proper. That the public stand in need of

dental education scarcely needs stating; that they are wholly to blame for their surprising state of ignorance is hardly true; that, to some extent at least, there are others than the unregenerate public lacking in a proper knowledge of oral hygiene is true. I have heard a prominent dentist of this state relate how he asks his little daughter as she comes to breakfast if she has cleaned her teeth, and receiving a negative reply says to her—"No clean teeth, no breakfast," and the incident and implied practice of brushing the teeth before breakfast rather than after supper, went unchallenged. I am reminded in this connection of a verse in the Scriptures: "If judgment begin in the congregation of the righteous, where shall the ungodly stand?"

So general is the need of oral regeneration, and so rare the perfect set of teeth in a perfect environment, that we may say the obvious results of ignorance and neglect are universally present. As conscientious dentists our office should be not only to repair but to instruct as well; to teach those measures which when put in practice shall insure good teeth—proper care and a continuing state of health and usefulness. In a sense we hold the oral welfare of the public in trust, and we are not faithful to that trust if we are content to do nothing towards discharging it. I hold, therefore, that as individual dentists, and as an Association we should take advanced ground in this matter and do something definite toward alleviating present conditions. In this as in every other good work the greater part of the effort expended must be lost, but some permanent benefit can be accomplished, and it is this modicum of good which must encourage us.

I shall not go into the subject matter of the desired instruction, since either the food-and-development division, or the oral hygiene branch of it, would require separate papers for adequate treatment; but will suggest some avenues through which we can effectively reach and benefit generations present and to come. Naturally it is through the mother that we must hope to accomplish the greatest good. She it is who provides or looks after the food supply of the infant; who during the formative period of childhood suggests or prepares the diet of the child; and who must early and late look after the habits of that child, and by persuasion, coercion and example teach it the proper care and use of its teeth. Then if she shall have done her work intelligently and well, and the habit of

systematic cleanliness shall have become fixed, the child need never consult the dentist, except to show to him such an ideal condition as he rarely has the good fortune to see at present. But the question is—how to reach the mother. As a girl she has been under our care and we have patiently drilled her in caring for her teeth, appealing to whatever incentive would operate most powerfully to keep her up to the mark. But later she gets married, generally speaking, and then we cannot presume to take the liberty or the necessary time to go into the questions of nutrition and development that affect the teeth (and no less the general health and growth) of the child which usually comes along. Now would it not be a good plan to keep an eye on the Birth Notices, and whenever you see mention of a new one in your flock, make a memorandum of it and a few weeks later send the mother a copy of Mrs. W. M. J.'s "Letters of a Mother to a Mother," or some specially prepared booklet, possibly briefer than the one mentioned, but gotten up in attractive shape with a striking title, and containing definite and practical information about food values and the relation of food to development; the importance of *early* attention to the subjects suggested and the hopelessness of such attention if put off until after the sixth or eighth year. Such a pamphlet would strongly appeal to the mother's interest in the welfare of the child and accomplish a vast deal of good.

As another means of reaching the mothers, and incidentally others, there is the press. The news syndicates issue articles of doubtful composition and questionable advice as a matter of common interest and probably have to pay something for them. Why not furnish them with authoritative articles ably edited and free of cost. They would be glad to get them, and the circulation of such articles would be enormous. Again, the articles in the household magazines are sometimes good so far as they go, but could be greatly improved on and at the same time made more interesting. It is largely through this medium and the "woman's page" in the daily and weekly newspapers that we could reach the mothers of the country with a few timely hints about their babies and youngsters—what they should feed them and when and why; and then other chapters on the cause and prevention of dental decay. I find our local papers are always glad to print articles of this kind, and the writing of them would be most excellent practice for the mind

of the dentist in formulating facts and theories, and a splendid preparation for association work, so the benefit from this practice would not accrue to the public alone.

The two avenues already suggested are the most important, because they offer opportunity for dietetic and developmental instruction to those who can secure the early benefits of proper observance of nature's demands to those in their charge. After a child is old enough to go to a dentist the structural die is cast and the best we can do is to repair the breaks and seek to improve the environment. This leads us to the third suggestion, a plan too late for the structural rehabilitation of the teeth erupted and nonerupted, but which may yet accomplish much towards their preservation and usefulness. This plan is one which we have worked to some extent and which really suggested the title of the paper. It is the employment for the purpose in hand of the public and private schools, or in other words, the regular educational channels.

To begin with, the school text-books should have at least one chapter devoted to the teeth and their care, and that chapter should be edited by a practical dentist who knows something about his subject, with an interesting quiz compend attached, and an attractive illustration or two illuminating the text. It is astonishing how even the less interesting things we studied at school linger in our minds; and a chapter of this kind would be something definite and tangible that the child or student could apply to his own case, or failing in this application, would involuntarily store the lesson away to be called into action by some subsequent event—perhaps the extraction of a hopeless and highly inflamed first molar. There are also the County Teachers' Institutes and the Teachers' Reading Circles. Here a dentist and a piece of chalk can reach the teaching principal of every school in his county. He may illustrate his talk or not as his talent indicates, but he can put on the blackboard the main points as he goes along, and much condensed information will be passed on through the teacher's note-book in this way. In his later visits to those schools he can very quickly tell if the pupils have received any part of the instructions given to the teachers.

Last of all we come to the school-room itself. How our minds go back to the very pleasant breaks in the monotonous routine of school life, when Prof. or Dr. So-and-So came to talk to us about

the Aryan races of Asia; the Pyramids of Egypt; the Cave Dwellers; the Mound Builders, or other anthropological and paleolithic syllogisms. What a treat it was! and to this day we remember how he looked (and may the Lord forgive some of us for emulating his example) and some of the things he said. Now, what if a wideawake dentist had dropped in on us, with a smile on his face (dentists always smile) and a "jolly" for our teacher, and a pretty little story about a wonderful lake surrounded by glistening white cliffs, in between which were the richest little farms and truck patches imaginable; and how the voyagers in this lake discovered these garden spots and settled and started flourishing colonies in them, and how they multiplied so rapidly that in a very short time they began to be crowded, and then they began to bore into the cliffs. But just as they were getting down to work there came a great rope, as it were, in between the cliffs where they dwelt, and the most of them were dragged out into the lake; then again a mighty broom swept down and around the cliffs and carried many more of them off; and finally there was a great storm on the lake and the water was changed, so that nothing could live in it, and all the inhabitants thereof were killed. And suppose that while the story progressed the colored crayons were traveling here and there over the blackboard, and just as the tale ended, we had there pictured before us what we at once recognized as a beautiful set of teeth, clean, white and regular. Do you think we should ever forget the story or the lesson, which would be emphasized by a full explanation of the cause of decay, the meaning and use of antiseptics, and a practical demonstration of the use of floss silk, tooth-brush and mouth wash.

In addition to this instruction it is always well to explain the evil effects of mouth-breathing, which is much more generally practiced than currently supposed, also thumb-sucking.

So far as reaching large numbers of the rising generation with effective instruction under the most favorable circumstances on the care of the mouth and teeth, the school room is the best plan I know of. The conditions are all in our favor; the interest manifested is positively inspiring, and the results are most happy.

Discussion. *Dr. W. E. Grant*, Louisville: The paper is a very good one and I have no criticism to offer. Several dental societies in this vicinity have taken up this matter at various times and all manner of schemes have been tried, from articles in the Sunday

newspapers to lectures for the school children and examinations of their teeth. A committee of dentists has also conferred with the school board, and pamphlets have been distributed to the teachers. The plan of having a number of dentists visit the schools and give talks, did not succeed, for many men thought their fellow practitioners would accuse them of self-advertisement. Lately the college of which I am dean has furnished the principals of the schools with little slips, setting forth the fact that the teeth should be cared for, and that if any of the children are in need of dental attention they should visit their family dentist. Where they cannot afford this the principal is to fill out the ticket and send the children with it to the college, where the necessary work will be done without any charge whatever. This plan has been in practice about two months, and we believe it has done much good and we do not feel that the college has been imposed upon. I heartily agree with the essayist that the proper field for this dental missionary work is the public schools, and the teachers as well as the children should be impressed with the idea of the value of the teeth.

Dr. L. P. Haskell, Chicago: Dr. Frank Alfort, a prominent oculist of Minneapolis, some time ago inaugurated a system whereby the eyes of the children in the public schools of that city could be examined by the teachers by the use of letters. If it was found that any eyes were defective, a note was sent to the parents advising them to take the children to an oculist. The results were very flattering, and later the same method was established in Chicago. It might be well for the dentists to try something like this.

Dr. J. H. Baldwin, Louisville: I believe that the mother is the one to be interested, for if she is not mindful of her children's welfare I am sure the teacher will not be.

Dr. C. W. McGuir, Munfordville, Ky.: I believe the proper method of dental education is through the text-book, as impressions made on the child are generally communicated to the mother.

Dr. J. S. Cassidy, Covington, Ky.: I think the best method of reaching the public, the teachers and the children, is by individual contact, rather than collectively.

Dr. A. Wilkes Smith, Richmond, Ky.: I have noticed that the care of the body or anything along the line of physiology is a very popular study with almost all children, so I endorse the plan of using text-books.

CONTINUOUS GUM DENTURES.

BY L. P. HASKELL, D.D.S., CHICAGO. READ BEFORE THE KENTUCKY STATE DENTAL ASSOCIATION, MAY 14-16, 1901.

It seems that there are not nearly so many plates put in as in years past, though plate work is an important item, as you all know. I will call your attention to a symposium in the January *Items* about vacuum cavities. Some writers were of the opinion that same were a necessity; some that they were not, while others were entirely indifferent. John B. Snow claimed that the dentures were held in place by adhesion and not by suction. If the plate is properly constructed you can get all the adhesion necessary, and if the plate fits I am always satisfied, even if it does not adhere quickly. Every dentist knows that the palate is hard, but there are a multitude who say that the middle portion of the upper part of the jaw never changes. The alveolar ridge gives way extensively, often to the ruination of the jaw, owing to the undue absorption of the alveolar process, and it is only a question of time when the plate rests on this hard part.

The one change that I made in this model was to put in what I call a "relief" over the hard center, extending over the margin of the jaw and into the margin of the plate. I have my patients wear the plate back as far as possible, allowing it to extend beyond the porcelain fully a quarter of an inch. Dentists sometimes say, "You have a vacuum there." In this case there is no defined edge. In other words, the plate will adhere just as well without the relief, provided, of course, that it does not rest upon the hard center. One of the writers in that symposium said there was no difference between the vacuum cavity and the relief. The vacuum cavity rests on the hard center and in a few months it will rock, while the relief allows the plate to rest on the alveolar ridge, avoiding this difficulty. I make no use of air chambers, but use the relief in every case.

Here is a model of the upper jaw where the alveolar ridge is all gone. A portion of the bone has been removed, owing to a necrosis. The patient had had six plates made of rubber but none suited him. I made him one of aluminum which fitted perfectly. I always succeed better with a swedged plate than with one of rubber. After swedging the plate I tried it in, pressing it up with my fingers, and then could not remove it without instruments. A year or two

afterwards, as he was going away, he asked me for a duplicate to use in case of accident, stating that he never knew he was wearing a plate.

Here are two specimens almost alike. The first represents eighty-five per cent and the second two per cent of mouths. This plate fits every portion of the palate.

This is a model of a plate made for a campaign speaker. I made him a rubber plate at first which was not satisfactory. Then I made him one of gold. In three months he told me that he had made speeches every day without the slightest difficulty. The relief in this case is absolutely essential, and to a greater extent than in the other case, because the plate rests on the hard center, causing it to rock and also to irritate. Here is my own plate. There is no upper ridge. You see there is a very high ridge in my palate but it is very symmetrical.

In making a successful fit in a plate for the upper jaw I deem essential these things. In the first place, a plaster impression. When I take same I know what I have every time. I know that if I get a good impression good results will follow. The next thing is relief in the palate. Third, a Babbitt metal die which was introduced into this country by me. There is a great variety of formulas for Babbitt metal, and in order to cheapen it they substitute lead for tin. The kind which I gave to the manufacturers contains one part of copper, two of antimony, and eight of tin. I use it because it has all of the essential qualities of metal. It is non-shrinking, hard enough not to batter, and has a much lower fusing point than zinc. I consider this absolutely necessary in securing a fit in an upper denture. You cannot pour lead without great difficulty upon Babbitt metal because it melts it. I reduce the fusing point of the counter-die by adding five parts of lead and one of tin. Don't pour it on until it thickens, and then it won't adhere.

There is another point in regard to shaping the plate. It should be worn high, but not enough so to irritate, making it wide and trimming it down. It should also be worn higher over the cuspid teeth, and it is a rare case where you cannot make it so. We see many plates for an upper denture no higher in one place than in another, which causes depression and plumping out under the nose. A plate worn high can be retained in the mouth with much more ease because it adheres better. Recently I made a new upper set

and applied plumpers. Notice the size, the height here, and the fullness over the cuspid teeth.

The next thing is in regard to the artificial denture. I attribute the greater majority of failures to bad articulation. I never allow the six anterior teeth to come together at all. The lower teeth come forward in the majority of cases, thereby very easily displacing the teeth because of the leverage. Never allow the six anterior teeth to meet. If the teeth are long when they come together something is bound to give way. Use the thick articulating carbon paper. Tell the patient to close rapidly, which will give you correct articulation. You can thus see on which side the black is most prominent and grind off. Then bring the pressure on the bicuspid and first molars.

In regard to continuous gum dentures. It remains to-day the only perfect denture ever put in the mouth, and it is the strongest and most durable. Everything depends upon the putting together of the denture. The strength of a continuous gum set is not in the porcelain but in the metal. There are so many dentists who are trying the experiment of using a very thin plate—31 and 32 gauge. I never use anything less than 28 gauge, and reinforce the plate across the heel. Then I reinforce the edge of the plate about one-fourth of an inch wide, which elevates that part and leaves no projection there, as well as strengthens the plate. The inner edge is turned out a little, as it protects the porcelain. Don't use a three-cornered nor half-round but a flat wire. I roll out a round wire in the mill and then file off one edge. You must have a backing on your teeth. So many simply solder the pins of the teeth to the plate. I prefer backing these teeth up with a strip of platinum and soldering the backing to the plate with pure gold. We all know such a set is the most natural looking, and it is perfectly clean and healthy to all of the tissues of the mouth. Be careful in the articulation of the teeth not to have a strain on the plate, or it will cause the porcelain to crack. Sometimes the teeth are worn on an inclined plane. In such cases I either grind the tooth to a flat surface or else crown it. I do not recommend porcelain for partial cases to any extent. A few years ago in the Chicago Dental Society, a prominent dentist was much admired for his gum work but he said that he could not repair it. A pupil of mine remarked that he thought the gentleman was mistaken, as he had seen me repair a number of these

sets. I am just as sure of good results as if I were repairing a rubber plate.

Now a few words in regard to the lower denture, which causes the dentist more trouble. The upper denture covers a broad surface, while the lower sets on a ridgeless jaw with scarcely anything to keep the plate from sliding back and forth. The greatest trouble is because the impression taken extends down under the tongue. What is the result? The glands and tissues rise way up above the margin of the plate, and if the plate is wide on the lingual side, it lifts up and down. In my own case it is rounded up and is not lifted by the tongue.

I noticed this morning one of the students repairing a lower rubber plate—he was just flasking it. In response to my question of how he was going to do it, he gave the usual method, which was by dove-tail, cutting, grooves and holes. This is entirely unnecessary. Cut out all the old rubber and pack in new against a clean scraped surface with a hot spatula.

Some dentists have raised the question in years past as to whether aluminum is a good metal to use, alleging that it is affected by the secretions of the mouth. I say that it is not. The specks of iron in the aluminum formerly used rust out, leaving little pits in the surface, but aluminum as made by electrolysis is free from contamination. It is certainly preferable to rubber. In fact, any metal is preferable to rubber. In using aluminum you should use a good thickness—say 22 gauge, or even 20 is better. Unless you use it thick the strain of mastication will bend it. In regard to the blowpipe, I find that a person solders better with a mouth blowpipe, as he can more easily control the flame. The blowpipe so universally used now is simply a jeweler's blowpipe, and is not fit for use. A dentist needs a larger one, and it will not tire the muscles so readily.

OPERATIVE PROPHYLAXIS OF THE ORAL CAVITY.

By F. MESSERSCHMITT, D.D.S., ROCHESTER. READ BEFORE THE ROCHESTER DENTAL SOCIETY, April 9, 1901.

Cleaning the teeth is one of the most important as well as most neglected operations in dentistry. More teeth are lost from allowing tartar to collect and remain upon them than from any other cause, but with the steady advancement in dentistry, and the improved instruments furnished us by the manufacturers, I think

most members of the profession are making strenuous efforts to treat these conditions, and many teeth are saved that would have been considered worthless in former years. Still, many patients present in whose mouths other practitioners have performed very extensive and artistic work, but have paid no attention whatever to the cleaning of the teeth.

Why this very important operation is totally neglected by such men is hard to comprehend. Is it a lack of early training, or are other operations more remunerative? But what becomes of the teeth?

A set fee is an uncertain remuneration, as the dentist is not able to judge beforehand in regard to the amount of work necessary to complete an operation. It is true that some people retain their dental organs throughout life without giving them any care, but that does not justify the dentist in slighting this work when patients place themselves in his hands, expecting him to save their teeth.

More attention should be paid this subject in the colleges, so that the students will realize the importance of thoroughness in these operations. Children should be taught from the kindergarten up how to properly clean their teeth, for if the habit is once acquired it will in most instances be continued throughout life. Pupils appearing in an unkempt condition at school are sent home by their instructor; why not send them home if they neglect to clean their teeth?

The instruments should be so constructed that they may be easily applied to every part of every tooth. Considerable manipulative ability, however, is necessary to perform the operation in a skillful manner, and this skill can be acquired only by practice. Several sittings are sometimes necessary for the completion of the operation, especially when the tartar has accumulated in very large quantities. The first appointment I make with all patients is for the purpose of cleaning their teeth, completing the operation at a subsequent visit when necessary. I then have a clean mouth to work in and can make a more careful examination of the teeth, also observe if the patient is doing his duty towards keeping the teeth in a perfect condition. I remove all the tartar from one tooth before passing to the next one, and the mouth is then syringed out with tepid water containing a pleasant deodorant. In the meantime the instruments are wiped off perfectly clean by the assistant, so as to look present-

able before being used again, a feature the patient is not slow to observe. In cases of pyorrhea the instruments are cleaned and sterilized before being used a second time, as I fail to see how this condition is improved by passing an unclean instrument from one tooth to another. After all the tartar has been removed the teeth are polished with fine pumice carried on rubber wheels, disks and brush wheels, dental fibre is then drawn back and forth between the teeth to cleanse the approximal surfaces, the mouth is sprayed out with three per cent solution of pyrozone, and instructions are given in the use of the brush, floss silk and quill toothpick, and a tooth powder is prescribed. The patient is then dismissed and instructed to rinse the mouth out with a weak solution of sodium chlorid on reaching home, to allay the inflammation.

Discussion. *Dr. H. H. Tompkins*, Utica, N. Y.: In opening the discussion of this paper I am reminded of a member of one of our dental societies who used to make the following remarks about four-fifths of the papers which were read: "I am very much pleased to be at this meeting, and I have been greatly interested in the paper presented, as I consider it a most excellent paper. I heartily approve of it, and know of nothing of particular interest which I could add to it. Mr. President, I move a vote of thanks be extended to the essayist for his admirable paper." I can do no better than to apply these remarks to *Dr. Messerschmitt's* paper and emphasize them. The subject is one which is neglected by a great many dentists, who in other respects may be excellent operators. Why this is so is a problem. In the first place, many of the older practitioners never realized in their early days what a powerful factor cleanliness was in the preservation of the teeth, and so do not pay much attention to it now. In the second place, the quacks bring this work into disrepute by offering to clean the teeth for nothing. Of course their cleansing is of the most superficial nature and increases the irritation rather than otherwise. This brings up the important matter of fees, for it has become a popular idea that cleaning the teeth is not much of a job. People trust our judgment in ordinary dental operations, and we must educate them to understand the importance and necessity of a perfectly clean mouth. When this is done they will be willing to pay us for the work. The public should be trained to realize that they do not pay us to make jewelry boxes of their mouths, but for the good resulting from

wisely directed skill and labor. If there is any one thing which taxes my strength and patience it is thoroughly cleaning a set of teeth, especially in those aggravated cases where the tartar is deep seated. On general principles I believe a pull instrument is preferable to a push one, because it brings the loosened tartar to the surface. If allowed to remain this would not reattach itself, but might be a continued source of irritation. Push instruments are much more apt to wound the gum, and the patient is always in fear that they will slip. Some years ago I cleaned a lower cuspid with push instruments, and after considerable work supposed the tooth was clean and that the debris was all removed. Some days later a fistulous opening appeared over the root of that tooth, and it was undoubtedly caused by the irritation of the loosened but remaining tartar. Amalgam fillings should be carefully polished. I have left one unpolished in my own mouth, so as to remind me how disagreeable it can be. Where there is an accumulation of soft tartar on the buccal surfaces of the molars, it is positive proof that the patient is not thoroughly masticating his food. The teeth of the human race are deteriorating because we insist on having nothing but soft food and refuse anything which requires thorough mastication. Dentists should not get in the habit of preaching or lecturing while at work, but suggestions can often be made to good advantage. We owe much of our present enviable position to continued education of the public, and herein lies the remedy for a condition of things which we now deplore.

Dr. B. F. Lasalle, Rochester: During my early practice a man came to me and wanted his teeth cleaned. He asked if I cleaned teeth as all dentists did, and upon my replying that I presumed so, he said that he wanted me to clean only one or two a day unless I could do more than that thoroughly. This taught me a lasting lesson.

Dr. B. G. Saunders, Rochester: In this as in other things we must start with the children, and if they can be trained to care for and think of their teeth there is hope for their future. When I find a child that will not keep its teeth clean I have it come to my office two or three times a week for inspection, thorough cleaning with the tooth brush, and advice. This usually starts the habit.

Dr. J. H. Beebe, Rochester: When patients ask me how much I charge to fill a tooth, I reply by asking them how much they

would charge to dig a hole, or tell them the story of the old darkey who was explaining why he charged one dollar for whitewashing—"Two bits for de kalcimine, two-bits for w'ar and t'ar on de brush, two-bits for de work, and two-bits for to know how." I do not trust instrumentation alone in cleaning teeth, and always use in addition a one to eight solution of sulphuric acid.

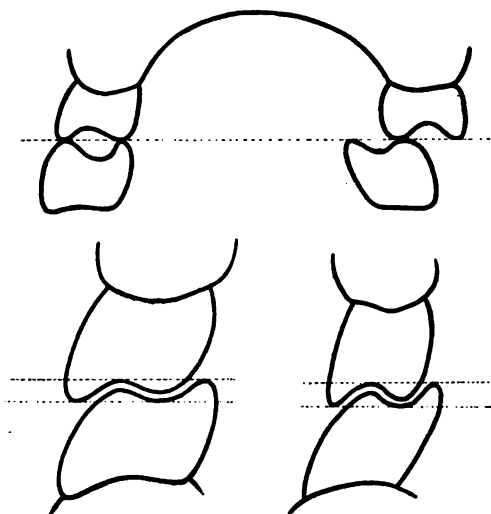
Dr. B. S. Hert, Rochester: Pull instruments are better than push ones, being more effective and less objectionable to the patient, but I do not believe they are necessary for bringing out the particles of loose tartar, as this matter will always work out unaided.

Dr. Messerschmitt: Unless patients are willing to give proper remuneration for cleaning teeth we should not touch them, both for the moral effect and in justice to the teeth. We should impress upon our patients that a little tartar does nearly as much harm as a large amount, and consequently teeth should be thoroughly cleaned every few months.

GLOSSITIS CAUSED BY A LOWER RIGHT MOLAR.—*Dr. Stavisky, Paris*, in a paper read before the Societe d'Odontologie describes the case of a man who came to him for consultation with regard to a highly inflamed condition of the tongue. The family history revealed the presence of the uric acid diathesis among its members. Sometime previous to his coming to the office he had consulted a physician, who diagnosed the trouble as a buccal leucoplakia. At that time he complained only of an annoying sensation, no real pain being present. These symptoms lasted one month and then disappeared. The physician again cauterized the affected parts. Three weeks after this treatment the patient complained of severe pain in the tongue. The physician then prescribed some anodyne gargle. The pain decreased for a while, but then returned with greater intensity. From that time the right side of the tongue began to swell, the swelling increasing daily. The patient could not take any solid nourishment, not only on account of the size of the inflamed organ, but also because of the pain brought about by mastication. "The mouth is kept open nearly all the time, and the saliva escapes from it. The right border of the tongue is more inflamed than the left, but as the edema is so considerable there is very little difference between the size of the two halves of the organ." While examining the borders of the tongue a small ulcer was found opposite the lower right molar. "The lingual half of the masticating surface of this tooth was filled with cement, slightly disintegrated at the lingual border. This border was very thin, and it was only by touching it with the finger, that one could realize its sharpness. Without any doubt this glossitis had been caused by this sharp edge." Either of two modes of treatment could have been followed: First, to polish the sharp edge and treat the tooth; second, extraction. *Dr. Stavisky* followed the second course because of the difficulty of introducing a polishing wheel on account of the pronounced swelling. He prescribed a mouth-wash, and ten days afterward all traces of the glossitis had entirely disappeared.—*Cosmos.*

Digests.

OCCCLUSION OF ARTIFICIAL TEETH. By Eugene Pettit, D.D.S., Philadelphia. Read before the Minnesota State Dental Association. The late Dr. Bonwill considered his "method of articulating teeth" the greatest discovery of his life; yet this method has not been generally accepted. I heard him say many years ago that "he had then been more than thirty years drumming it into the dental profession and they would not take hold of it." Personally, I am particularly indebted to Dr. Bonwill for his ideas on this

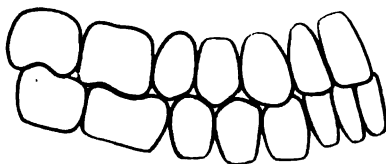


Articulation according to Dr. Bonwill.

subject, for it was while attempting to put them into practice that I discovered what I believe to be a more practical method. While Dr. Bonwill's scheme is very interesting from a theoretical point of view, the fact of its not being more generally accepted by the profession (a profession, too, most keenly on the alert for advanced methods) proves most conclusively to my mind its impracticability.

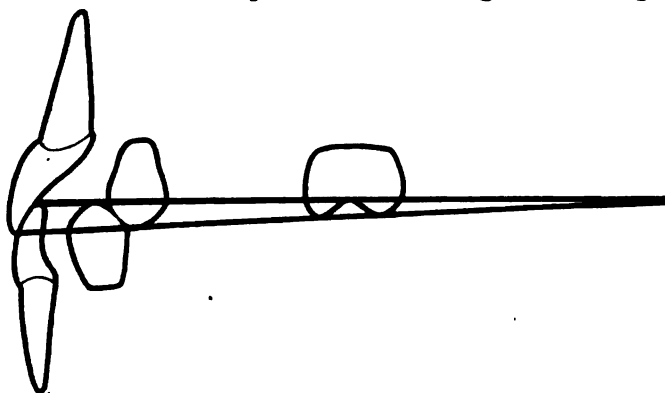
Before submitting to you this method of articulation, in justice to myself I ought to state that it has given entire satisfaction to my patients; and I firmly believe that when it is properly understood by the profession they will unhesitatingly pronounce it an important aid to mastication. I consider that any method or principle that

promises to aid us even in the smallest degree to masticate our food with artificial teeth should not be allowed to pass without due consideration and a trial. While I could refer to a number of cases, I do not deem it necessary to mention more than two—both typical cases. Mrs. B. came to me three years ago; she was eighty years old, having worn artificial teeth more than thirty years, but never



Articulation according to Dr. Bonwill.

with comfort. The plates I made her were constructed on this method of occlusion. She volunteered the statement to me that they were the only teeth with which she could satisfactorily masticate her food. Mrs. P., a woman of fifty years, had worn many sets of artificial teeth, but without satisfaction. Her husband, a man of means, believed it was possible for her to get something better;

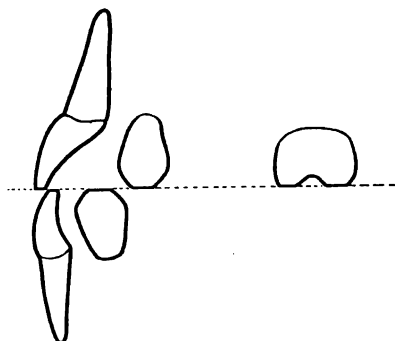


Overbite according to Dr. Bonwill.

and with this idea secured a list of dentists who did their own mechanical work. He called on me, and I explained this method. His wife was highly pleased with the results.

We must bear in mind that, while artificial teeth are not natural teeth, it is of the greatest importance that they should present a natural *appearance*. This much accomplished, their usefulness as masticators becomes paramount. I contend that an artificial denture

is controlled in the mouth only as a mass or a block of carved wood. All interlocking of the cusps, and the overlapping of the incisors, I have found to be decidedly detrimental. It is quite natural for persons wearing artificial teeth to speak of them as being perfectly satisfactory. This is simply because they have learned to manipulate them with some degree of success, not knowing that a still more perfect result can be obtained. The mouth is frequently and correctly referred to as a "mill," and it is as a mill that it should be regarded by every dentist who desires to assist his patients to properly masticate their food; for it is through this grinding process of mastication that digestion truly begins, that food is properly assimilated and man's physical and mental equilibrium established.



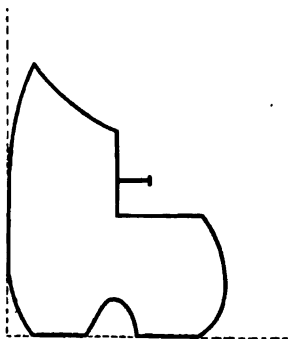
Ground Cusps with no Overbite according to Dr. Pettit.

How can we convert the mouths of our patients into working mills? Simply by avoiding everything that will interfere with the grinding action of the teeth and the natural motions of mastication. This, in my opinion, necessitates doing away with the overlap of the incisor teeth, as well as the interlocking of the posterior teeth, by grinding them to a flat but by no means to a smooth surface. I find that I can do this best by simply holding the cusps against the side of a grindstone and grinding about one-third of the cusps down, setting the upper incisor teeth to project beyond the lower. This will give them the appearance of overlapping.

After the denture is finished, it is placed on the side of a grindstone with a pressure on the incisor teeth; this will grind a sharp cutting edge, and as the lower jaw is pushed forward to cut the food the sharp, angular edge on the buccal surface of the lower teeth will come in contact with the sharp ground edge on the palatine surface

of the upper teeth, and while masticating the food the tilting of the plates will be reduced to the minimum.

I will now give you a few comparative illustrations of the old and what I term a newer method: but before doing so I should like to say a few words about preparing the mouth for the plate. In partial cases where we are obliged to depend entirely upon artificial teeth for a masticating surface, I would always advocate opening the bite until the remaining natural incisors are on a horizontal line, the upper with the lower. After the bite is opened I would consider that all remaining natural teeth, which are not on the same horizontal line already established, a detriment to the full benefit to be obtained and would extract them. When the posterior teeth are moved out of position, even though a portion of one tooth should be

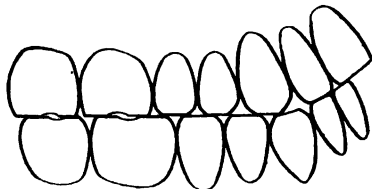


Section of Tooth Ground on Cusps.

on line, I would extract this to restore masticating surface; and also to allow dentures to go into place with the least possible manipulation. I consider the cutting of plates to overcome the difficulty of putting them in place a sacrifice of rigidity. All you cut away in such cases prevents that rigidity which you hope to obtain by holding on to the teeth which are so far removed from the original position.

Dr. Bonwill says "That it should need no argument to convince you that an artificial denture should correspond to the natural one in every respect; as nearly as can be approached." In my opinion an artificial denture should *not* correspond to the natural one except in its appearance. The artificial teeth of to-day, if arranged as intended by the manufacturer, would present a grinding surface so irregular that, while undergoing motions of mastication, the contact with the lower teeth would be reduced to a few high cusps, and the

plates would be thrown from their position by the overlapping of the incisor teeth. To get the benefit of the full masticating surface one would be obliged to chew by simply opening and closing the jaw, in the same manner as a hinge opens and shuts. Artificial teeth are made to-day as they were years ago; notwithstanding the fact that Dr. Bonwill first mentioned his theory in 1858. The grinding surface of the teeth made after Dr. Bonwill's method is too irregular and too smooth for mastication. The grinding surface of the natural teeth is irregular and rough. The grinding surface of teeth made after this method is flat and rough; just as anything controlled as a mass should be for grinding or masticating purposes. If making the teeth flat necessitates the changing of the condyloid process, nature will adjust herself very readily, as is seen by her endeavor to turn incisor teeth into surface grinding teeth by abrasion.

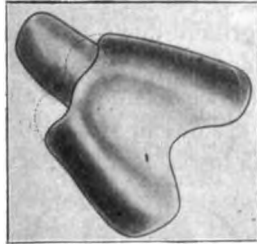


Articulation according to Dr. Pettit.

This method of occlusion does not necessitate so careful a selection of teeth as former methods, yet the best results are obtainable only by the use of appropriate teeth. I suggest deep sulci to make a rough grinding surface, and teeth with a long bite, as they are more agreeable to the tongue. The posterior teeth should be so shaped that the masticating surface is on a right angle with the buccal surface. I think the great majority of cases require that all teeth should be built on this plan. The idea that the buccal surface of the lower teeth must slant in to properly occlude with the upper artificial teeth is erroneous. When taking impressions of the upper jaw, avoid using an impression cup with too high a rim, as it bulges the lip and cheeks and stretches the membrane from the bone. To avoid this I cut away two-thirds of the rim in front, and, after putting the plaster in the mouth, depress the lip all around with the finger, so the plaster will be pressed close to the ridge. This will give a much tighter-fitting plate, one that will better exclude the air.

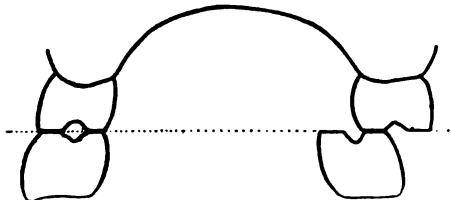
I would like now to call your attention to an extreme but by no

means an exceptional case. I have never seen one where a patient has lost so few teeth, and at the same time has so little use of those remaining. Notwithstanding the fact that there are many molars and bicusps left in the mouth, the lower incisors are touching the upper gum, and have even gone above the gingival line. This has not been done, however, without considerable damage to the mouth,



Impression Cup out away.

for it has spread the upper incisor teeth by acting on an incline plane. There has been so much pressure brought to bear on the few remaining antagonizing teeth that it has shortened them by absorption of the bone and process, notwithstanding the incisor teeth are very strong, which is proven by the centrals not separating more than an eighth of an inch, the difference being gained by pushing the lower

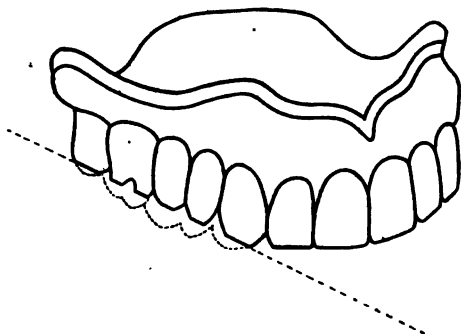


Cross Section, Showing Movement over Ground Cusps.

incisor teeth inside of the arch, and possibly some change in the normal relation of the condyloid process with the glenoid cavity. The patient is under the doctor's care suffering with complicated disorders.

We must meet these difficulties and restore the mouth to a condition which will enable the patient to properly masticate his food. It is plain to be seen that we must open the bite; but how much? To that point where the lower incisor teeth can best reach the upper incisor teeth for cutting. This point establishes the line. (Under-

stand where the incisor teeth are left remaining we can have no overlap.) But in this case we also find the right lower and upper molar antagonize, which prevents the lower incisor teeth reaching the upper. This necessitates the grinding off or the extraction of the upper or lower molar before the line can be established. This brings us to the point where we are obliged to decide whether the case requires bridge work or plates; if bridge work, the lower molar must be devitalized and ground down to use as an abutment; but we will suppose the patient does not wish bridge work. Then the question is, Which teeth shall we extract, if any? Since opening the bite is imperative, there are one or two upper teeth on the left side which will not touch the lower teeth. As we have decided not to

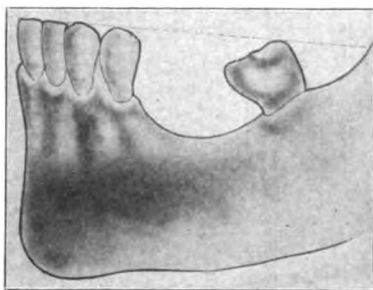


Upper Set—Cusps Ground.

use bridge work, we cannot lengthen these teeth to antagonize by that means; which shall we extract? This is a subject I would like to discuss more at length with any present who may feel an interest in this particular case. I would, however, under such conditions, without reference to this particular case, extract all the natural teeth which would be a detriment to the usefulness of the plates—all that would interfere with the rigidity of the plates, and all that would lessen the masticating surface. I firmly believe that, were I to have all my teeth extracted, and allow sufficient time for absorption to take place, then were to construct plates, using the natural teeth in as near the same relation to the jaws as possible—the plates so constructed would not give me as much satisfaction as if they were made with flat and rough masticating surfaces as above advocated.

When a patient comes to me for artificial teeth, I first prepare

the mouth by extracting all teeth that I consider will be a detriment to the usefulness of the dentures. That will include all teeth that have grown too long through lack of antagonists or from other causes, all teeth that we find overlap the line mentioned, or that do not reach it. By the line, I mean a line drawn from the cutting edge of the incisor teeth straight back. Also extract all teeth that lean over, which leaves only the posterior cusps on the line. Then I thoroughly clean all remaining teeth. I advocate only plaster impressions, and smooth rigid impression cups that cannot be bent; such as German silver or the old-fashioned porcelain tray. In every partial case I always remove the cup from the impression, and therefore regard any roughness of cup, wax, compound, or anything that

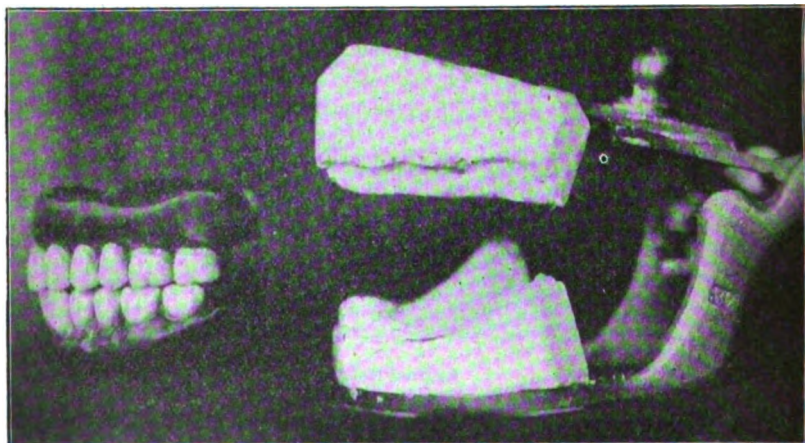


Extract Molar.

will interfere with its easy removal, as a hindrance. Use a quantity of plaster to fill up the irregular spaces between cup and mouth; and do not depend upon bending, filling in with wax, or any material to approximate the general outline of the mouth. Such methods are not only unnecessary but bungling.

After the cup is removed and the plaster is quite hard, break the impression out in pieces; and do not hope to remove an inch of plaster through a seven-eighth's space. After all pieces are removed, I take each piece and allow the force of water from spigot to wash away any crumbs which would interfere with the replacement of sharp fractures. In putting impressions together always use the cup, as it gives relative positions. I always take the bite at the same sitting, and use the mush bite exclusively. It takes only a few minutes, and the casts and base plates are not necessary for its use. I advocate the mush bite for the following reasons: In the

first place it is the most accurate. there is no slipping of the base plates on the mucous membrane. The patient does not have in mind the bringing together correctly the wax covered upper and lower jaw, but on the other hand is told simply to mash the wax. The patient's mind is then on using a certain amount of force, and whether he mash the wax little or much, in the great majority of cases you have an accurate relation between the upper and lower ridge. It also saves time for both patient and operator. The fullness at the time of taking the bite does not have to be considered. I contend that after the length is established and the models out-



lined, the position of the teeth will always be in a certain relation to those outlines. All fullness necessary for expression will depend upon thickness of wax from the neck of tooth to outline of plate, and can best be determined after the teeth are waxed in place. In other words, the position of the teeth is the same whether the rim of the plate is thick or thin. I have the patient mash the wax slowly, then tell him to stop, but don't open. Then I see if the lips will come together when muscles are relaxed. If necessary, have him mash further until the lips just meet. Next mark division line of lips, which answers for length of both upper and lower teeth, also mark center line.

I use silicate of soda very much diluted as a separating medium; and I never use any shellac or varnish. They are not twice in the

same condition and only fill up the interstices. The alcohol preparations are also expensive. I think every one who uses silicate of soda enough to become familiar with it will discontinue the use of all other preparations for this purpose. One great advantage of it is that you are enabled to pour the impression immediately after taking it from the mouth; the impression being wet when it is poured gives more accurate results. In making artificial dentures success lies largely in attention to detail. It is the little things that make a success or a failure. Don't mar the casts. Don't allow sticky wax to come in contact with the casts, as its removal takes some of the plaster with it. Don't rub the cusps of plaster teeth that you are fitting as antagonists, and thereby give yourself unnecessary grinding after the plate is finished. After the models and mush bite are placed together, they are ready to put on any kind of an articulator. The more simple the articulator the better. I then measure the distance from the top of articulator to division line of the lips marked on the wax bite. This establishes the length of both upper and lower teeth. I commence with the central after having all cusps so ground that when laid on a flat surface they will touch.—*Review, Feb., 1902.*

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LESIONS PECULIAR TO PRIMARY DENTITION. By C. E. Bentley, D.D.S., Chicago. Read before the Northern Illinois Dental Society, 1901. The knowledge regarding the lesions peculiar to primary dentition is becoming exact. The day when the family physician used the phenomena of primary dentition as a cloak to hide a blighting ignorance is rapidly passing away. Almost any disease of infants which baffled the unskilled and untutored man of medicine in days past was attributed to "teething," but in the dawning of specialties and their subsequent elaboration the lesions of first dentition are clearly defined and classified. Dentistry has contributed much to this condition of affairs.

Primary dentition is a physiological process, but like another physiological process—utero-gestation—it is one of continuous irritation. Irritation then is the one thing with which we have to contend, and to constantly remember in the management and consideration of the lesions it induces. This irritation occurring in a healthy infant with the normal eruption of the teeth will not, in a great majority of cases, occasion any disturbance worthy of scien-

tific notice. When in an unhealthy child, and the eruption abnormal, lesions more or less grave do occur and with these we shall concern ourselves.

To understand dental irritation presupposes a knowledge of dental evolution. Without the knowledge of the time and character of an erupting tooth, one is as helpless as a ship at sea without its rudder. We also must understand that there are some diseases that retard or accelerate dentition; that many teeth may be in process of eruption at the same time, thereby intensifying the irritation and producing reflex phenomena, all of which can be modified by an intelligent use of the lancet and a thorough knowledge of dental evolution.

The various works on children's diseases make as many classifications incident to first dentition. The following, however, seems to be the most generally accepted and rational: 1. Localized stomatitis. 2. Irritative fever. 3. Diarrhea. 4. Spasms.

I. *Localized Stomatitis*.—The first symptom of this condition is an itching of the parts affected. The child will make this manifest by rubbing its gums upon any hard substance it may carry to its mouth. An excess of saliva will flow as a reflex of this stage of irritation. Inflammation of the gums will soon follow this condition and will extend or be circumscribed in accordance with the constitutional condition of the child and the number of teeth erupting. As for example—If several teeth are erupting on opposite sides of the oral cavity the inflammation is liable to become diffused, but if there is but a single tooth coming and the child is not of an inflammatory cachexia the tumefaction will be circumscribed. Several constitutional conditions are responsible for diffused inflammations in the oral cavity in dental evolution, namely, tuberculosis, syphilis, rachitis and cretinism. These conditions may also induce retarded or accelerated dental evolution and almost always are accompanied with aggravated inflammatory conditions of the oral cavity.

Syphilitic children are prone to early dentition and early decay of the teeth. Nursing children erupt their teeth earlier than those artificially fed. Rickets delay dentition more than any other cause, save cretinism. The delay of dentition in rickets may be from eight to twenty months, while in cretinism teeth may not appear until years after the time of their normal eruption.

The appearance of the gum over an imprisoned tooth is largely indicative of the physical condition of the child and always denotes the use or nonuse of the lancet. The part over a tooth indicates lancing when it has a glistening, tense and inflamed look. Such a gum is "ripe" for lancing, and in case of any of the six anterior teeth, a single incision across the incisal edge of the tooth or teeth is sufficient. In case it be the molars a crucial incision is necessary.

In an unhealthy child the gums present a flaccid, relaxed and soft-looking appearance and all parts look as if any additional irritation would result in a breaking down of same. Lancing in such a child's mouth becomes a serious problem. 1. Because the control of the hemorrhage would be a serious matter. 2. The inflammation already induced by the unerupted tooth or teeth would become intensified, which might produce a more complicated condition than the simple localized stomatitis present. In this condition constitutional rather than local treatment is indicated. This constitutional treatment, it is needless to say, is largely dependent upon the character of the disease with which the child is suffering and truly belongs to the physician's realm, or more properly speaking, to the specialist in children's diseases. Diatetics, hygiene and sanitation are, however, the potent agents to-day in the treatment of such diseases, instead of drugs.

2. *Irritative Fever.*—The characteristic difference between irritative fever and inflammatory fever is that one appears and disappears quickly, the other has a rhythmic rise and fall. In an infant the lancing of an inflamed gum, under which is an imprisoned tooth, in the majority of cases causes a subsidence of the ill effects of irritative fever, while inflammatory fever has a logical course and ending. The symptoms of this malady are muscular excitability, thirst, rapid pulse, rise in temperature, convulsions and sometimes death. When, by exclusion, irritative fever is pronounced to be the cause of the above symptoms, and lancing is indicated, the supplemental treatment is important. Many drugs are recommended and much literature is written for its control. But there is one effective remedy found in *hydrotherapy* that should be placed above all others. The *cold bath* does allay the grave symptoms of this disease and in the writer's opinion should be used to the exclusion of drugs. The rationale of the cold bath is not so much to reduce the temperature,

which it surely does, as to stimulate the nerve centers to greater activity, thereby aiding the pores, glands and secretory organs in their power of elimination of poisonous products.

3. *Diarrhea.* The alimentary tract from mouth to anus is covered with mucous membrane. Hence it is not difficult to see that a localized stomatitis, by reason of its continuity, may extend to any part of the tract. It is in such cases that diarrhea may be induced. The vascular perversion consequent upon an inflamed mucous membrane primarily induced by the irritation caused by imprisoned teeth can and does produce diarrhea in children. This trouble may arise from many causes, not needed to be considered here. All diarrhea in children is not caused by an unerupted tooth, but if upon examination we find the mouth inflamed and the redness extending to the fauces and as far as the eye can detect, we can safely conclude that such diarrhea is caused by irritation incident to dentition. The lancet here is, as in all these cases, the one remedy to apply. If internal medication is indicated the physician should administer such treatment.

4. *Spasms.*—A spasm is an irritation, direct or indirect, of the terminal branches of the spinal cord. That an unerupted tooth in a child may cause a spasm is without doubt true. Dr. Nathaniel Pfeld reported a case where a child had suffered from repeated spasms for a period of over two weeks. It was examined from head to foot for the cause. Consultants were baffled in their attempts to discover the origin. The spasms increased with alarming frequency until they had begun to despair. At the beginning of one of the spasms one doctor noticed a twitching of the muscles of one side of the face, and lifting the lip found an imprisoned cuspid. Upon extraction the spasms ceased and there was no recurrence.

In the intelligent use of the lancet a word might be said. When it is determined that the lancet should be used it should be thoroughly sterilized before so doing. Infection from an unclean lancet has occurred in the lancing of the gums. Too much stress cannot be placed upon this phase of the subject. In the control of hemorrhage, which is often a troublesome factor, the method open to the least objection is the use of hot water. Styptics and coagulants do have their place, but with the exception of adrenalin, which is a compound of suprarenal capsule, hot water is at once the most effective remedy.—*Review, Feb., 1902.*

DENTAL AND OCULAR AFFECTIONS RELATED. By G. H. Bicknell, M.D., Omaha. The intimate nervous connection through the trigeminus of the eyes and teeth fully accounts for the numerous reflex neuroses recorded, and the vascular and lymphatic conditions existing in the head and face render easy of transmission from the alveolar process to the orbit any infectious process occurring therein. The subject then may be classified under two heads: (a) Reflex neurosis traversing the fibres of the fifth nerve; (b) infections spreading by continuity of tissue. Cases coming under the latter classification are much more serious, and will be considered first.

Infections which travel from a diseased tooth upward to the orbit by continuity of tissue may result simply in an orbital cellulitis, subsiding in a few days without doing harm; but if the infection be more severe, and the pressure be more intense and of longer duration, the vision may be injured, and is at times totally lost. In some cases the infective process extends by various routes into the cranial cavity, giving rise to brain abscess or to a fatal meningitis. Hirsch found in the literature up to 1894 twenty-five cases of orbital abscess caused either by infection following the extraction of teeth or by purulent alveolar periostitis. Hallauer and Dagaliski have since reported similar cases. Many cases have no doubt occurred which have either gone unrecognized or have never been reported.

Infection usually reaches the orbital cavity in one of two ways: (a.) It may travel from a diseased tooth under the periosteum on the anterior surface of the superior maxillary bone until it reaches the orbit. Infection by this path is, according to the researches of Gurwitsch, facilitated by the plexus of veins which passes upward under the periosteum in this region, forming an anastomosis with the ophthalmico-facial, this in turn communicating with the inferior and superior ophthalmic veins, thus completing the ophthalmico-facial plexus. (b.) The second and much more common method is that in which the antrum of Highmore is first invaded, then the orbit through the thin orbital plate of the superior maxillary bone, or by the vessels passing outward or upward to anastomose with the orbital vessels. Once having gained access to the orbit, infection may easily reach the brain, and it is not surprising that many of these cases die from cerebral complications. The brain may be infected via the optic foramen, the frontal sinus or

ethmoid cells, or the process may pass backward along the ophthalmic vein through the sphenoidal fissure, thus quickly reaching the cavernous sinus.

The gravity of phlegmon of the orbit may be appreciated by considering the sixty-nine cases cited by Hermann. In thirteen vision was very much reduced, seven became totally blind in one eye, and four died from brain abscess or meningitis. Of the three cases reported in this paper, one died from brain abscess and two became totally blind in one eye.

The case coming under my own observation was: W. B., aged 7 years, first seen Jan. 28, 1901. He had been taken four days previously with moderate toothache. The next day the pain was more severe, he had a chill, and the side of the face became moderately swollen. The following day he had a rigor of extreme severity, the face became more swollen and the eye protruded slightly. In the afternoon of the third day he was taken to a physician, who advised the parents to see a dentist, who removed the offending tooth, the first upper molar on the left side. On the evening of the fourth day he was brought to Omaha. He had a temperature of 101° at this time, the left side of his face was swollen and indurated, the eyeball turned out slightly and protruded to such a degree that closure of the lids was impossible; chemosis was marked and the cornea was rapidly becoming roughened by exposure. Thinking from the history and appearance of the case that the antrum of Highmore and perhaps the ethmoid cells had been infected from the diseased tooth, an exploratory puncture was made through the alveolus into the antrum in the vacant space left by the extracted first molar, but no pus was found. Deep exploratory punctures were made in the orbit around the eyeball without result. The following day the symptoms were worse, and a deep incision was made into the orbit above the eye, which was followed by a very small amount of pus. The third day after he was first seen the eye protruded still more and was more markedly deviated outward. Under cocain a deep puncture was made into the orbital tissues just at the inner canthus, which was followed by a large amount of fetid pus. Careful probing demonstrated the fact that a large portion of the internal bony wall of the orbit was denuded, also that it was one of those rare cases in which the infection had traveled upward from the molar tooth following the venous plexus

mentioned by Gurwitch, under the periosteum on the anterior surface of the superior maxillary, and had reached the orbit in this manner. A glass drainage tube was kept in the last incision and in about six weeks all suppuration had ceased. During this time he had a rise in temperature almost every day. When first seen the patient could count fingers at from eight to ten feet with the eye on the affected side and ophthalmoscopic appearances, other than slight blurriness of the nerve, were normal. His vision gradually became worse, and when last seen about three weeks ago he had no light perception in the eye, the optic nerve was completely atrophied, and the eye was still slightly turned outward. During the first two weeks the protrusion of the eyeball being so marked that the lids could not be made to cover the cornea, a thick layer of pure white vaseline was kept constantly in the palpebral fissure and no further trouble was experienced from corneal erosions.

The following two cases are from the practice of Dr. Gifford and have not heretofore been published: Case I.—Benjamin B., aged 27, had an abscess of the left antrum of Highmore. A tooth was removed and the antrum opened through the alveolar process July 20, 1900. This was followed by much swelling of the eyelids on the same side and a discharge of pus through a sinus in the upper lid. When he came to Omaha, August 14, there was a profuse discharge of pus through several sinuses in the left upper lid. A probe detected bare bone and loss of substance in the bony roof of the orbit. The right eye was normal, the left eye had no perception of light, but was objectively normal, except for a slight blurring of the optic disc. After a free opening into the orbit through the upper lid, and the insertion of a glass drainage tube, the pain, which had been severe, disappeared for a day or two, but returned with much general depression, so that on August 17 it was decided to eviscerate the orbit. This was done, and the frontal sinus and ethmoidal cells were opened and the latter found to contain pus clear to the posterior extremity. After this the temperature ranged from 98° to 99°, the pulse from 70 to 48, and the pain in the head continued more or less constantly, making it altogether probable that a brain abscess existed; but while discussing the desirability of searching for it in the anterior part of the frontal lobe at the seat of the defect in the orbital root, the man died very suddenly on the morning of August 22. The autopsy disclosed an

abscess in the anterior part of the frontal lobe containing about half an ounce of fetid pus. This communicated by a small opening with the lateral ventricle. The sphenoidal sinus was found to be half full of muco-pus. Case II.—A woman, aged 40, had the second upper left bicuspid extracted on account of caries. This was followed by an inflammation on that side of the face, accompanied by swelling of the lids and protrusion of the eyeball. Soon after an abscess broke through the upper lid; when the swelling of the lids subsided she was found to be blind on that side. She was not seen by Dr. Gifford for two or three years after this happened. At that time the left eye was found to be normal externally, but with an atrophic nerve and no perception of light. The right eye was normal. The left lower lid was drawn down and out by a scar adherent to the malar bone.

Hirsch mentions a case in which the second left upper molar was extracted by a veterinary surgeon. Infection and phlegmon of the orbit speedily followed, and when the orbital swelling subsided the patient was totally and permanently blind in one eye. German literature is rich in similar cases, and one author mentions the frequency of the infections which follow the manipulations of veterinary surgeons and barbers, who it seems do a great deal of tooth extracting in European countries.

In Sattler's case there had been pain for three months in the region of the left nasolabial fold. Nov. 6 the second left upper molar was extracted. The next day the left eye was swollen shut, pain on the left side of the head, tenderness about orbit, swelling on submaxillary and preauricular glands, eyeball protruding out and down and only slightly movable. Infection of antrum of Highmore, ethmoid cells, and frontal sinus followed in rapid succession, and on Nov. 16 patient died with symptoms of brain abscess. The autopsy showed intense congestion of the meninges, with perforation of dura over the cribriform plate and an abscess in the left frontal lobe.

Neuroses—Knied says that between the first and seventh year almost everything is attributed, not alone by the laity, to teething, hence the literature is rich in this respect.

Power, in concluding an address before the Odontological Society of Great Britain upon the connection between ophthalmic and dental disorders, spoke as follows: "Having, however, established the

existence of reflex irritation of the eye, it will perhaps be the best mode of treating the subject if we consider it under the following heads: 1, Reflex irritation affecting striated and unstriated muscles; 2, affecting the mucous membrane and cornea; 3, affecting the optic nerve, retina and intraocular tissues. In regard to reflex irritation affecting muscular tissues we have: 1, Paresis of ciliary muscle; 2, of intraorbital muscle; 3, of muscular fibres of iris; 4, of ocular muscles; 5, of orbicularis palpebrarum muscle." He says further, "In conclusion, I think then it may be laid down as a maxim to be generally observed, that in all cases of threatened glaucoma, especially when this is associated with ciliary neurosis and obscure pains in temple and maxillary orbital regions; in all cases of mydriasis and probably of myosis originating without apparent causes; in all cases of sudden paralysis of either of the orbital muscles (in absence of cerebral symptoms); in all cases of phlyctenular disease of the conjunctiva; in all cases of sudden failure of accommodation, especially in young children; and finally in cases of exophthalmia, the condition of the teeth should at least be examined."

In a lecture on the relation of ophthalmic to dental disorders Dr. Galezowski, the well-known Paris ophthalmologist, dwelt on the close correlation between some eye troubles and caries of the upper teeth. He said that in young children the slight inflammation and discomforts accompanying the cutting of the first teeth produced keratitis and small corneal ulcers, and that these could sometimes be cured by treatment of the teeth, and that in the shedding of the first teeth a spasm of the orbicularis was sometimes observed which could be removed by extracting the teeth. With the shedding of the third molars corneal inflammations occur. In adults the commonest results of dental caries on the eyes is a weakening of accommodation by reflex action through the fifth pair of nerves. Of this Galezowski gives two examples: An American lawyer had had for two years such weakness of accommodation as to make his work almost impossible. There was no hypermetropia or astigmatism, but two of the molars of the upper jaw were stopped with gold. Dr. Galezowski advised their extraction, and in a few days the patient was able to resume his work. From this it was concluded that the troubles arose from compression of the dental nerve. In another case in which the weakness had lasted for three years,

it improved greatly soon after the extraction of a single molar. There was also a case of temporary but almost complete functional blindness following extraction of an upper molar in a man aged 20. Conversely, in a nervous woman, a patient of Galezowski, who had amaurosis of one eye, perfect sight was immediately recovered by removal of a carious molar on the same side. Dr. Gifford's case book contains the history of a man who became gradually almost totally blind in his right eye in 1888, and remained so for some months until the removal of a carious upper molar on the same side, when he quickly recovered. The case reported by Allport, in which poor vision of some years' standing was permanently cured by the removal of carious upper teeth, is somewhat similar.

Schmidt found in ninety-two patients with toothache seventy-three who had restriction of accommodation on the affected side. He thought this disturbance of accommodation to be due to increased intraocular tension, but Knies believed it to be due to lack of vigorous innervation caused by the distressing pain. Priestly Smith, who measured the tension with his tomometer in sixteen cases, could detect no inequality in the two sides, and later found the tension in eyes under similar conditions in some instances harder and in others softer than that in the opposite eye. Hutchinson reported a case of panophthalmus from spasm of the levator palpebra superioris during toothache. Weill reported a case in which one eye had an excessive flow of tears which greatly annoyed the patient. The lachrymal apparatus appeared to be entirely normal, but upon examination of the cheek on the same side it was found to be slightly swollen and tender. One of the upper bicuspidis was found to be reduced by caries to a snag, and after removal of the roots the epiphora ceased.

Amblyopia.—Hermann reported the case of a girl 5 years old who suddenly became totally blind after extraction of the second upper deciduous molar. She was found to have choked disc in each eye and the left abducent was paralyzed. After two days she began to have light perception, and after four months vision in her right eye was a little over 20-100 and that of the left was 20-50. This is perhaps analogous to the blindness which has been known to follow surgical procedures on the turbinate bodies.

Swanzy, the Dublin oculist, writes: "Reflex amblyopia is said to have been observed in connection with irritation of the fifth

nerve, especially the dental branches; but I have not seen such a case and am skeptical as to its occurrence." On the contrary, De Wecker relates the case of a seamstress in whom the sight of both eyes was reduced to mere light perception after repeated severe attacks of toothache. Extraction of carious teeth from the left upper jaw resulted in restoring normal vision to the left eye, and later extraction of those in the right upper jaw restored vision in the right eye. Many more of these cases are reported by various authors.

Knies says that pains in the upper teeth are frequently symptoms in the so-called ciliary pains of keratitis, also that neuralgic toothache is sometimes a prodromal symptom of glaucoma. Redard recites the case of a woman 28 years old who had glaucoma in her right eye. The tension was very high, while the left eye was normal. Dr. Abadie did sclerotomy upon two different occasions, with only temporary benefit. Examination showed carious teeth in the right upper jaw, upon the removal of which the tension of the eye became normal.—*Western Med. Review*.

* * *

EMPYEMA OF THE ANTRUM OF HIGHMORE. By Mr. J. H. Bradley, New South Wales. I do not purpose going deeply into the various opinions regarding the causes of empyema, but should like to remark in passing that the theory that this disease is commonly due to some dental lesion is somewhat in disfavor of late. Though when one considers the close anatomical relation existing between the roots of the bicusps and molars and the floor of the cavity the probability of an alveolar abscess being the cause seems very patent. The prevailing opinion is that it follows on some constitutional derangement, such as influenza, predisposing conditions being polypi, hypertrophic rhinitis, deviation of the septum, etc., which by interfering with the opening under the middle turbinate prevent the escape of any fluid the antrum may contain.

Operative treatment is resorted to, and this consists in opening at a suitable point, curetting, draining, and subsequent douching. The old operation of extracting one or more teeth and opening through their sockets has not been practiced so generally since the medical profession and patients have been educated to value sound natural teeth as organs not to be parted with till every means for their preservation has been exhausted. Another difficulty is that

the thickness of the walls through which the instrument has to pass renders it difficult, if not impossible, to thoroughly curet the floor of the sinus. Opening through the mesial wall after removing part of the anterior portion of the inferior turbinal has its disadvantages: The difficulty of maintaining a channel for further treatment; the position of the opening renders the douching by the patient a very awkward procedure, as, although the passing in of a syringe point or a Eustachian catheter by the experienced hand of surgeon or nurse is an easy matter, the average patient finds it a very difficult feat to accomplish; the danger of having an opening into a cavity in which was probably the original seat of the disease. The operation usually practiced when there are no teeth missing or badly affected by caries is to remove a portion of the wall in the region of the cuspid fossa. The sinus can be readily curetted and the opening maintained by means of a plug retained by a band attached to one of the bicuspid.

My object in bringing up the subject is to draw attention to a point which does not seem to have attracted any serious notice heretofore. At least I can find no reference to it in surgical authorities dealing with this branch of practice. To make my point the more clear I will take the liberty of reminding you of some dry details of the distribution of the nerves, etc., in this region. The diagrams showing the course of the superior dental nerves vary in all the text-books that I have seen. They all agree in this respect: the anterior division supplies the incisors and cuspids, the middle division the bicuspid, and the posterior division the molars. De Morgan in *Tomes* represents the posterior division as two branches, one supplying the molars and the other reinforcing the plexus formed by the three divisions over the roots of the molars and bicuspid. The anterior superior dental branches off the maxillary division of the fifth just before it leaves the infraorbital canal to emerge through the infraorbital foramen. It passes just below the lower boundary of the foramen and proceeds downward and forward in a canal in the anterior wall of the antrum to supply the incisors and cuspid.

The middle superior dental is not always present as a distinct branch, in which case its fibers are associated with those of the anterior superior dental. When distinct it passes from the infraorbital canal at a variable point, usually rather toward the posterior part of

its floor. It then proceeds downward and forward in a canal traversing the anterior wall of the antrum and floor of the cuspid fossa to supply the bicuspid.

The posterior superior dental is usually represented as two branches, leaving the maxillary division while it lies in the sphenomaxillary fossa. They proceed downward and forward on the zygomatic surface of the maxilla for a short distance, then enter the posterior wall of the antrum and proceed forward to supply the molars and communicate in a plexiform manner with the middle and anterior superior dental to form the superior dental plexus. Each of these nerves furnishes, amongst others, twigs to supply the mucous membrane of the antrum. The blood supply in this region is derived from branches of the third part of the internal maxillary artery which in general traverse the canals with the dental nerves.

It will be obvious after this description that in opening into the antrum through the cuspid fossa, the middle superior dental, or at least that portion of the superior dental plexus supplying the bicuspid, is severed, thus depriving those teeth of their main nerve and blood supply. There seem strong *a priori* reasons for supposing that such an injury to a nerve would be followed by grave disaster to the teeth. The result of severance of the pulp from its nerve supply is, as we know, degeneration and ultimate death. In the present case the bicuspid would be the teeth to suffer. Should death occur we must then expect in many cases pericementitis and abscess to supervene. If suppuration sets in it seems possible that sometimes pus may find its way into the antrum through the floor, which is perhaps weakened by long-standing inflammatory conditions, and so presumably retard or prevent the cure of the disease. Or even short of this, the presence of an alveolar abscess in close proximity would seem likely to keep up a reflex irritation in the antrum tending to prevent or delay the natural healing or cure of the disease conditions therein existing. If it be true that some such causes as these, direct or reflex, are indeed sometimes sufficiently potent to excite inflammation in a previously healthy antrum—and some think that this is the most frequent of all causes of antral inflammation—it is by so much the more likely to have a detrimental influence on the health of an already diseased sinus. It seems advisable, at any rate, that after the cuspid fossa operation the patient should be sent to a dentist for examination. As I will

point out later, it will be necessary to have several examinations, at, say, monthly intervals.

Of course I recognize the possibility that the life of the pulp may be maintained by fibers passing in below the level of the opening made in the bone from the superior dental plexus. The course of the fibers through the plexus has, so far as I can ascertain, not yet been followed. A case illustrating the fact that life may persist for some time after the main trunk is supposedly severed came under my notice a short time ago. A lad was sent to me for a plug to maintain an opening through the cuspid fossa. I saw him a month after the operation and carefully examined the bicuspid, finding them undoubtedly alive. I next saw him about twelve months afterward, and on transilluminating found the bicuspid, which were quite sound, dead; I fancied that the first molar was also affected. The diagnosis in this case was not conclusive, as the tooth was very extensively filled. I do not as a rule see patients again after fitting a plug, but in all cases which have come under my notice the bicuspid were dead.—*Cosmos, Jan., 1902.*

* * *

MODELS WHICH ARE DURABLE AND WHICH CAN BE PAINTED. By Dr. G. Port, Heidelberg, *Oesterreich-Ungarische Vierteljahrsschrift für Zahnheilkunde, Oct., 1901.* Reviewed by Dr. W. H. Potter in *International, Jan., 1902.* The ordinary model made from plaster of Paris is not so hard and durable as could be desired, and it fails to suggest the color of the tissues which it represents. The author takes it for granted that the production of a model more durable than the one commonly made, and also of one which can be painted so as to represent in a lifelike way the conditions of the tissues as they exist either in health or disease, would be an end much to be desired. And first he reviews the way in which attempts have been made for the improvement of models.

A much used method is to simply paint the plaster model with an oil color. The author says this does not accomplish much, as the color soon strips off, and the appearance and value of the model are thus seriously impaired. A second method is that of Professor de Marion and Touvet-Fanton—plaster is abandoned and a mixture of two parts paraffin to one each of wax and stearin is used. These three substances are melted together and coloring-matter added. To reproduce the color of gum-tissue madder-red and carmine are

used, and for the tooth substance mignonette yellow. The properly colored waxy mixture is poured warm into the impression and a model produced. The process of making a model in this way is very complicated, and takes much time. Very beautiful results can, however, be obtained by it. The author next speaks of a much used process whereby a plaster model is boiled in stearin. By this means a model obtains a very beautiful yellowish color, but its durability is not really increased. A fourth method is that of Julke. Take six parts of plaster and one part of freshly slacked lime. Mix these together and use as ordinary plaster. When the models are well dried, place in a ferrosulphate and zinc sulphate solution. A fifth method consists in immersing plaster models, which have been well dried, in an alum solution. The models to be immersed for half an hour. The solution should be made of one part iron-free alum and six parts water.

Although much has been attained for the improvement of models by the above-mentioned methods, the author believes that his own method is a decided advance upon those described. He uses a mixture of plaster of Paris, chalk, and a glue solution. This combination is poured into the impression and allowed to harden. The glue to be used is not the cabinet-maker's common glue, but French hare or rabbit glue. Of this glue a three to five per cent solution is made. After the preparation of the glue solution, a mixture of plaster and chalk is made in the proportion of three parts plaster and one part chalk. This mixture must be very exact. The plaster-chalk mixture must now be made with the glue solution into a stiff porridge. This porridge cannot be poured into an impression as if it were a simple plaster mixture; it is too viscous. A hair paint-brush must be used, and the material must be painted into the irregularities of the impression. By this means the impression can be filled. At least twelve hours are required for hardening before the model can be separated from the impression. Any form of impression material can be used. A model made in this way has at first almost the hardness of a plaster model, and after about eight days it is like hard wood to cut with a knife. The model must now be prepared for painting by a coating of linseed oil. When this is thoroughly dry, oil colors can be used. These must be much thinned with turpentine. It is better to apply several thin coats than one thick one.

The author gives the following list of colors which he finds useful in the painting of models: 1. Madder lake 3, dark rose. 2. Bright, English red. 3. Carmine cinnabar. 4. Light ochre 1. 5. Clear, brilliant, yellow. 6. Terra di Siena. 7. Prussian blue. 8. Parisian ultramarine. 9. Clear green, cinnabar. 10. Burned terra di Siena. 11. Ivory black. 12. Kremnitz white. For the representation of normal mucous membrane a mixture of carmine cinnabar and Kremnitz white is to be used. Madder lake with white gives a rose color shading into a blue which represents an inflamed mucous membrane. The color of the teeth is produced by a mixture of ochre and white. The unessential parts of the model are painted black. Models constructed by the above methods are not only very durable, but are also true to nature, and well repay the time spent.

* * *

X-RAY IN DETERMINING THE LIMITS OF THE FRONTAL SINUS. By John Harold Philip, M.D., San Francisco. In the June number of the *Laryngoscope* I note the following from the pen of Dr. Jonathan Wright: "I have lately seen the frontal bone perforated and the dura mater wounded with disastrous results in a case in which the frontal sinus was lacking on that side."

Dr. Howard A. Lothrop of Howard University, after carefully examining 250 frontal sinuses, from dissecting-room material, concluded that there was no external landmark defining the superior limit of the sinus; that the external angular process of the frontal bone was not often the limit of the sinus laterally; that in the majority of cases the septum (between the sinuses) deviated to one side or the other within a range of five millimeters or even more, notwithstanding its frequent median position inferiorly; that the plane of the septum was roughly antero-posterior, passing between the anterior and posterior surfaces, but occasionally it might so deviate that one sinus would lie partly overlapping the other, even to an extent of two centimeters; that there were no absolutely certain guides by which the degree of development of the frontal sinus in the adult could be determined before attempting to expose it.

Previous to entering a frontal sinus some months since I secured three frontal bones and attempted to explore with my drill that sinus corresponding to the one on which I was to operate. I was amazed to find that No. 1 had almost no sinus on the left side; that the sinus on the left side of No. 2 extended not more than three

millimeters beyond the median line and that there was no septum; there was no communication with the left nasal cavity. No. 3 seemed normal. One cannot well overestimate the surgical importance of such anatomical anomalies, whose frequency is unquestioned.

As an aid to determining, previous to operation, the limitations of the frontal sinuses I suggest the X-ray. The radiograph illustrating this article was taken for me by Mr. Cox of the San Francisco Polyclinic. Length of exposure was eight minutes; distance of tube from plate, twenty inches; plate overdeveloped and the print was sun-printed and overtoned. My patient's head lay obliquely on the plate and the affected sinus lay undermost. This explains the position of the canula, its tip extending apparently beyond the posterior wall of the sinus. For cosmetic reasons I entered the sinus from within the nasal cavity. (My patient was a young woman of 24.) Wishing to be certain that my canula was not in an anterior ethmoidal cell, I had a radiograph taken, when to my surprise I saw clearly defined the limits of my sinus.

Incidentally it may be of interest to note that the antrum on the left side served apparently as a reservoir for the pus coming from the corresponding frontal sinus and anterior ethmoidal cells. I removed the anterior one-third of the middle turbinate and irrigated the antrum through the ostium maxillare. After a few days' treatment the fluid used for irrigation was returned almost clear in the morning, but rather cloudy in the afternoon, although only one-third as much time had elapsed between the washings. I plugged with gauze the natural opening into the antrum and was rewarded by getting no evidence whatever of pus as long as it remained there. This proves, it would seem, that the antrum in question was not the seat of an inflammatory process. It ceased discharging pus only when it no longer gravitated into it from the anterior ethmoidal cells and frontal sinus, by way of the infundibulum. The right antrum was also involved; it was entered through the alveolar process and a tube left in for draining.--*Jour. A. M. A., Mar. 1902.*

ALLOY.—According to the *Zahntechnische Reform*, one hundred parts of copper and six of antimony form an alloy with properties very much like those possessed by gold. The antimony is added to the melted copper and the whole is covered with charcoal ashes, magnesia and lime. It can be rolled and worked like gold; its color is like that of gold, and it is said not to become dark with age.

Letters.

THE BOSS CONSULTS WITH AN EXPERT.

(AS TOLD BY THE OFFICE BOY.)

I never Seen a man like the Boss to be Everlastin'ly gittin' in some kind o' Mux. Seems like he kind o' Hunts Round to find out whether they ain't some wrong Way fer Doin' things. You'd think Experience would Learn him to Watch Out, an' not git Fooled twice in the same way. But it don't seem to. He'll Set Down an' weave along by the Hour, a-tellin' me how dentists had orter do, an' you'd think they wasn't no Scheme could possibly Ketch him; then he'll Tumble to some old Fool Trick, an' lose Time an' Money, an' git himself Wild with Rage an' Disapp'intment, right in the Middle o' tellin' me. He done that very Thing this morning.

It was this way; he had one o' them Cases of what he calls a Tumor, growin' on a man's gum, an' he'd been treatin' it a Spell, an' it wasn't gittin' no better, an' he got Skeered, I reckon. Says he to the man, "I ain't so sure I know what orter to be done about this. What say ef I call in a Specialist, to consult with me?" "All right, jis' as you say." So the Boss he called up Dock Hotty, what's had a reg'lar Medical Course, besides Graduatin' at a Dental College. The thing that Supprised me about that was, the Boss has always kind o' Sniffed whenever Dock Hotty's name was mentioned, an' I even heered him say once he wasn't so Mutch, only lettin' on he was, an' he'd called him in once before, an' they both got Mad, an' the Boss said then, that was the last Time he'd ever ast Dock Hotty's opinion about anything.

So he called him up by telephone, an' Dock Hotty he said he'd haf to know first what he was a-goin' to be Paid, an' he said he Couldn't Think o' leavin' his Offis an hour fer a cent under Twenty-Five Dolars. The Boss he seemed Thunder-Struck at that, so he telephoned back an' said the Patient wasn't only a book-keeper, on a seven hundred Doler salary, an' nine children to Support, an' his wife a Infidel (er Invalid, er somethin'), an' so after some further Parleyin' Dock Hotty he Come Down to Three Dolars, pervided the Patient would come to his Offis right Away, 'cause he was a-goin' to be most Offul Busy, all day, after about a Haf Hour. Then the

Boss he told the Patient what Dock Hotty had said, an' he kind o' Kicked about the Price, the first thing. He said he could go to a Barber an' git it Cut Off for a Quarter, an' he wasn't a-goin to pay no Fancy Price for Fancy Fussin', nohow. He riz up out o' the Cheer, an, put on his Hat, like he was a-goin'. Then the Boss he ast him to wait a Minute, an' he telephoned agin, an' d'rec'ly he told the Man that Dock Hotty had agreed to come there for Two Dolers, pervided it could be attended to Right Away, fer he hadn't no time fer Foolin'. Then the Patient he finally agreed to that, an' so in about Five Minutes in come Dock Hotty. He come in the Operatin' Room, an' he never paid no attention when the Boss introduced him, but he went up to the Man an' he pulled his mouth open like it was a Valise, an' he Looked at the Tumor, an' he Prod-ed it with his Thumb, an' all the Time the Boss was a-tellin' him what he reckoned it was, an' all about it. The Boss said as near as he could make out it was one o' them Cystic Tumors, though there was Indications that it might belong to the class of Fibroma, or even Myomata, or likely as not Sarcoma, or somethin' or other. Dock Hotty he never paid the Least Bit of attention, but he looked Offal Profound, like he was a whole Medical University, with a Museum of Anatomy*throwed in. He'd prod awhile, an' then he'd say, "Close yer Mouth," "now Open," an' then he took out a Pencil an' he Writ somethin' on a piece o' Paper, an' at last he said to the Boss, "Fetch me some lukewarm Water," like the Boss had been his Offis Girl. Then when the Boss brought it Dock Hotty he syringed out the cut in the Tumor that the Boss had made, an' he took Up some o' the Pus that come out, on the point of a Spatula, an' looked at it reel Close, an' then he took out his Handkerchief an' Blowed his Nose like a Dinner Horn, out on the Farm.

Then says he, "Fetch me your Microscope," like he reckoned it was in the Closet. An' the Boss he looked Flurried, an' he got Red, an' he had to admit he hadn't got no Microscope. Then Dock Hotty he give jis' the teentiest bit of a Smile, kind o' Sarcastic, like as if he'd of said, "I knowed it," an' says he, "You can't tell nothin' about what this reelly is, without you've got a Microscope." The Patient he glanced kind o' Suspicious at the Boss, like he was beginnin' to see for the First Time how Offal he'd been Bamboozled, an' the Boss he kep' a-gittin' redder an' redder, but he was kind o' gittin' Mad, too, seein' how the Patient was bein' Impressed. Says

he, "You don't need no Microscope to tell what that is, Hotty. I more than Haf know myself, only I ain't so certain. If it ain't one o' them Spindle-Celled Sarcoma it's a Myeloid Growth with lanceolate or else caudate cells, though I couldn't find no cancellous bone, an' that bein' the case I doubt whether it ain't simply a Carcinoma springing from the Epithelium, filled with Vibriones or else Spirilla, blamed ef I'm sure which."

I seen that kind o gained the Patient's confidence agin, for Dock Hotty he hadn't used a single dern Medical Term, thus far, an it was clearly a Hoss on him, up to this Time. The Boss seen his Advantage, so he said some more. Says he, "My experience is, a Microscope don't help out wuth a Cuss in identifyin' pathogenic bacterial forms. I've got my Naked Eye trained so that I kin tell easy whether it's Saccharomyces er Torulaceae in most Cases, an' I never yit seen one o' these Microscope cranks that could come near that." Dock Hotty he turned an' he Looked reel Stiddy at the Boss, when he said that. Dock Hotty ain't so Excitable as the Boss, that is to say, he don't git Mad so quick, but when he does git Mad, everybody Knows It. Says he, "They's plenty o' Dentists that's got Microscopes, that won't agree with *that* opinion. If you've got Eyes that Good, all I've got to say is, you orter Use them sometimes, when you're Fillin' Teeth. What the Diavolo an' Tom Walker did you call me in fer, anyhow, ef you know so Mutch about this Case!"

Then the Boss he acted jis' like a Little Dog when a Big Dog kind o' Threatens him, an' the Little Dog he kind o' whines, an' shies off, like he was Afeard, but d'rec'ly he screws his Courage up agin, an' he comes nearer an' Barks at the Big Dog, like he was a-sayin', Come Ahead, ef you want to Fight, but you better leave me a-be. The Boss he ain't quite so Big as Dock Hotty, an' besides, his lower Chist swells out like a case o' Mumps. But he got back at Dock Hotty, all right. Says he, "What'n thunder do you mean, a-comin' in my Offis an' treatin' me like you was a whole Dental College Faculty, an' me only a Student jis' entered College fer Four toilsome years o' Billiards an' Vaudeville! Con-sarn your insolence, sir! Orderin' me 'round like I wasn't only the Offis Boy, too!"

It seemed like the Boss couldn't stand it a instant longer, but he up with a sofa cushion an' he Banged Dock Hotty over the Head

fer all he was Worth. Dock Hotty he seemed Considerable Surprised, but he never lost his Head, an' he grabbed at the first thing handy, which happened to be the Boss's Hot-Air Syringe, an' he Lit Onto the Boss an' he walloped him over the Head with the Rubber Bulb, like he was Insane. I was so took by Supprise myself, that I was tremblin' an' shakin' like I was havin' a Attack o' Gingivitis, an' I couldn't do nothin'. The Canary Bird hangin' in a Cage near the Boss's Cheer was drove in a Fit, it was so Excited, an' was flutterin' round an' spillin' feathers like it was Moultin' Season. Before I could even offer to Interfere, the Boss's Patient he sprung out o' the Cheer, an' he rolled up his sleeves Offul Quick, an' says he, "This seems to be right in my Line." An' before I knowed what had happened he Banged Dock Hotty one under the Chin, that sent him Headfirst agin the Door, an' almost at the same instant he Fired his other Fist agin the Boss's Nose, an' stretched him out about Ten Foot distant, on the Hall Oilcloth. Says he, "Now you two Fakirs fix matters up betwixt you at your Leasure; I'm a-goin' home. You needn't send me no Bill, an' I won't send either o' you none!"

I seen Dock Hotty was purty bad Hurt, fer he Laid Still, with his Eyes kind o' Glazed, like he didn't no nothin' so I stood over him a-countin' Ten, to see sure that he was Reely Out. But he never moved, so I throwed a Pitcher o' Ice Water on him' an' jis' then the Boss he begun to Git Up, kind o' slow an' Feeble, like he was jis' a-gittin' over Typhoid Fever. Then Dock Hotty he begun to Git Up, an' I told him he'd Lost, an' the Boss was Champeen, an' he begun to Cry. So the Boss he Seen That, an' nothin' would do but *he* must start in to Cry, too. Then they both got up, an' the Boss he throwed his arms round Dock Hotty's neck, an' he told him he'd always had a most Affectionate Regard fer him, an' he'd always stood up fer him when the breath of Slander assailed him, an' he wisht in his Hart they was Brothers. Dock Hotty he was kind o' Tilted Up agin the Boss's Breast, and he wasn't quite Woke Up yet, but he cried some more, when the Boss said that, an' he Wiped his Eyes on the Boss's Neck-Scarf, an' then he said his Front Tooth was Loose, an' the Boss he said, "You sit right down here, an' let me Fix It. Con-found that Patient o' mine; I'm a-goin' to have him Arrested for this!" So he tied Dock Hotty's tooth with a Silver Wire, an' after about Fifteen Minutes, after huggin' an'

Pattin' Dock Hotty, an' sort o' Cheerin' him Up, says the Boss, kind o' Sly, like he didn't want me to Ketch On, "Let's go over to Delmonico's an' see how the Political Champagne is doin'." (They ain't no Delmonico's in this city, reely; that's what they call Steward's restaurant, fer a nickname.)

I wasn't Fooled wuth a Cent, an' after about Two Hours the Boss he come back alone, an' he was Offul Meller, an' he set down an' held my hand like a Blame Fool. Presently, says he, "James, you may say what you please about Dentists, but in my Opinion they ain't a Dentist in this city kin compare fer a Moment with Dock Hotty. I jis' love that man. Kind-Harted, Amible, Efficient. A man without a Peer, James. I wisht I was such a Dentist, James. If you're really bent on enterin' the Dental Perfession, don't take me fer a Model; you take Dock Hotty."

Cincinnati, O.

FRANK W. SAGE, D.D.S..

HEMOSTATIC AFTER TOOTH-EXTRACTION.—Cotton-wool soaked in oil of turpentine and pressed into the bleeding cavity after tooth-extraction will check the hemorrhage promptly.—*Medical Summary.*

ALCOHOL CORRODES.—By Dr. J. B. Hodgkin, Washington, D. C. Some time ago I saw in a journal that the Johns Hopkins Hospital was using absolute alcohol for sterilizing purposes. Thinking this a good method of rendering aseptic my hypodermic needles, I dropped one in an alcohol bottle and left it there until I should want it again. The result was a needle almost as much corroded as if it had been dropped in acid. Puzzling over this, an unexpected property of alcohol, only a week after I saw the enclosed paragraph in the *Scientific American*, which is self-explaining. "The action of alcohol on metal is peculiar. Dr. Malmejac in his experiments used 95 per cent alcohol, which left no residue on evaporation. The metals, copper, iron, tin, lead, zinc and galvanized iron, were corked up with alcohol in glass flasks and kept at ordinary temperatures for six months. The copper was entirely unacted upon, but in all the other flasks there was a deposit on the bottom and the metal was covered with a similar deposit. In the case of tin, lead, zinc and galvanized iron the deposit was white; that from the iron was red, resembling iron rust, says *Science*. All of the liquids, except that in which the lead had been placed, filtered clear; the latter retained a milky appearance after repeated filterings through double filters. The clear filtrates from iron, lead, zinc and galvanized iron gave much residue on evaporation, while the residue from tin was hardly appreciable. In the former cases it is clear that not only had the metal been oxidized, but a considerable quantity had entered into the solution. These experiments have an important bearing on the storing and shipping of alcohol, as absolute alcohol is generally purchased in galvanized iron cans, so that it ought to require redistillation."—*Items.*

The Dental Digest.

PUBLISHED THE FIFTEENTH DAY OF EVERY MONTH

At 2231 Prairie Avenue, Chicago,

Where All Communications Should be Addressed.

Editorial.

SOME FACTS CONCERNING THE PRESIDENT OF ST. LUKE'S HOSPITAL OF NILES, MICH.

"CIRCUIT COURT BAYFIELD COUNTY.

"STATE OF WISCONSIN }

Against

"A. C. PROBERT. }

"We the jury sworn and empanelled to try the issues in the above entitled action, find the defendant guilty in manner and form as alleged in the information and find the amount so fraudulently embezzled at the sum of fifteen hundred dollars.

"J. O. GRÖUT, Foreman."

"State of Wisconsin,

"In Circuit Court Bayfield County.

"State of Wisconsin

vs.

"A. C. Probert.

"It is the judgment of this court that you, A. C. Probert, be confined in the state prison at Waupun, at hard labor by the Warden thereof for the period of two years and six months, the first day of your confinement therein to be solitary confinement."

"Wisconsin State Prison, Waupun.

"C. C. McClaughry, Warden.

Jacob Fuss, Chief Clerk.

WAUPUN, March 23, 1902,

"D. H. Crouse,

"Associate Editor DENTAL DIGEST,

"Dear Sir—I find your letter of the 20th on my return from a trip through Illinois. A. C. Probert was sentenced to this prison on July 23, 1896, for a term of two years and six months, by the Bayfield County Circuit Court, for the crime of embezzlement, and

"was discharged upon the reduction of his time by good conduct.

"Sept. 9, 1898.

"Yours very truly,

"C. C. McCLAUGHRAY, Warden."

ASHLAND, Wis., March 24, 1902.

"D. H. Crouse, Esq.,

"Chicago, Ill.

"Dear Sir:—Everything that I have said about A. C. Probert is a matter of public record. For a number of years I did dental work for Probert and his family, and visited him twice while he was in the penitentiary at Waupun. He called at my office several times afterward and once after he became a "Doctor." At that time he gave me his card which read—"Arthur C. Probert, M.D., Sec'y & Treas. of St. Luke's Hospital, Niles, Mich." You see I know the man.

"I have no sympathy for those who buy such "diplomas" or "certificates," They know what they are paying for and are just as big fakes as a man who would sell the things.

"Yours truly, J. B. WILLIAMS, D.D.S."

The above verdict and sentence are taken from the records of the Bayfield County Circuit Court, in the State of Wisconsin. The letters are from the Warden of The Wisconsin State Penitentiary at Waupun, and from Dr. J. B. Williams of Ashland, Wis. The A. C. Probert—the ex-convict mentioned in the verdict and sentence of the Court and Warden's letter as having been convicted of the crime of embezzlement, is the same A. C. Probert who under the name of Arthur C. Probert on the 17th day of November, 1898, two months and eight days after his discharge from the Waupun Penitentiary, joined in articles of association for the incorporation of "St. Luke's Hospital of Niles," he having been the leading spirit in the promotion of this confidence-game institution.

This is the same man who sends out his circular letters inviting the purchase of membership on the dental staff of "St. Luke's Hospital of Niles," and signs himself "Arthur C. Probert, M.D., D.D.S., President."

He is the same Arthur C. Probert who, in the alluring literature sent out by himself in furtherance of his confidence scheme, represents the capital stock to be \$100,000. We here reproduce what

the articles of association for incorporation of St. Luke's Hospital of Niles, as recorded in the office of the Secretary of the State at Lansing, Mich., and at St. Joseph, Berrien County, Mich., say on this point:

"ARTICLE IV.

"The capital stock of the corporation hereby organized is the sum of ten thousand (10,000) dollars."

"ARTICLE VI.

"The amount of said stock actually paid in at the date hereof is the sum of one thousand (\$1,000) dollars, being 10 per cent of the capital stock."

The subscription to this stock is further shown to have been as follows:

"Dr. Charles W. H. B. Granville, Niles, Mich 196 shares.

"Arthur C. Probert, Washburn, Wis 203 shares.

"Anna Bell Granville, Niles, Mich 1 share."

It is at once seen that Probert's paid in capital was exactly five hundred and seven dollars and fifty cents (\$507.50), and this more than one-half the assets of the entire institution.

The Granvilles, whoever they may be, are spoken of here; in the absence of a better acquaintance, as people to be known only by the company they keep.

Arthur C. Probert, M.D., D.D.S., LL.D., the man who when on trial for embezzlement in a Wisconsin Court cunningly urged as a part of his defense, that if there was any offense under the law it was larceny and not embezzlement, is the President and Treasurer of this disreputable outfit.

How his various degrees were acquired is unknown to us, but we think it can be found out, and when ascertained the DIGEST will publish the facts for the information and protection of the profession and the public.

Dr. F. H. Essig, Secretary of the Michigan State Dental Association, writes that the institution is a fake, pure and simple, and that no pretense is made of doing any hospital work.

In the October, 1901, DIGEST we published the various screeds sent out by this institution and called attention to its probable fraudulent character. We also published a disclaimer by Dr. Edgar O. Kinsman, protesting against the use of his name on the letter-head of the said hospital as utterly unwarranted.

To prevent further use of his name we advised Dr. Kinsman to enjoin the individual running this Gold Brick scheme and to sue him for damages. We also urged any others whose names had been used without their consent, to send out a disclaimer, secure injunction, and sue for damages. Since that time other dentists have stated in the journals, that their names were used on the letter-head of this so-called "Hospital" wholly without their knowledge or consent, but thus far nothing seems to have been done to stop the abuse.

We had supposed that when the fraud was exposed in the DIGEST this man would think it useless to continue operations, but he is still throwing out his bait to the unwary and unscrupulous. Hence from motives of public welfare we again devote some space in this issue to present such facts as will better acquaint the public and the profession with St. Luke's Hospital of Niles, Michigan, and its President, Arthur C. Probert.

It has been urged that the Protective Association take up this matter, but we are reasonably busy with other things, and furthermore do not see how it properly comes within the scope of the organization's work. We would strongly urge those dentists whose names have been used without warrant to lay the matter in detail before the Postoffice authorities at Washington for their consideration, to the end that if it be found that the law prohibits his practices that Probert may be again sent to the penitentiary, this time for using the mails to promote fraud.

ILLINOIS STATE BOARD OPINIONS.

In the December, 1901, issue of the DIGEST we published a communication from a correspondent who questioned the justice and validity of rule V in the set of rules laid down by the Illinois State Board of Dental Examiners, claiming that the Board had not put the right interpretation upon the dental law of the state. To settle the matter the Board asked the Attorney General of Illinois for an opinion on rule V and in reply he submitted the following, which covers the ground:

Feb. 11, 1902.

Hon. T. W. Pritchett,
Pres. State Board of Dental Examiners,
White Hall, Ill.

DEAR SIR:—Your favor of the 7th inst. is at hand. In reply

permit me to say that under the provisions of section one of the Act to insure the better education of practitioners of dental surgery, etc., approved May 30, 1881, there are four classes of persons who may be allowed to practice dentistry in the State of Illinois, to-wit:

(1) Persons who are engaged in the practice of dentistry at the time of the passage of the Act.

(2) Persons who shall have received a diploma from the faculty of some reputable dental college.

(3) Persons removing into this state who shall have been for a period of ten years prior to such removal practicing dentists.

(4) Persons holding the diploma of doctor of medicine from any reputable medical college.

These four classes of persons are to be allowed to practice upon the following conditions:

1st. As provided by section 4, all persons who are engaged in the practice of dentistry at the time the Act took effect must, within six months after the Act took effect, have registered with the Board of Examiners provided for in said act.

2d. All such practitioners who did not register within the six months must pass a satisfactory examination before said board before continuing the practice.

3d. While section 6 says that any and all persons who shall so desire may appear before said Board and be examined, etc., this means any and all persons who are eligible to the examination, and includes all persons who have received a diploma from the faculty of some reputable dental college, and all persons removing into this state who shall have practiced dentistry for a period of ten years, and all persons holding the diploma of doctor of medicine from any reputable medical college.

The section further provides, however, that graduates of a reputable dental college may be licensed to practice dentistry without examination. The law makes no distinction in the qualifications to practice dentistry between persons who have practiced dentistry for a period of ten years before removing into this state and persons holding the diploma of doctor of medicine from any reputable medical college.

As to the extent of the examination to be made, that is within the discretion of the Board of Dental Examiners, the only limitation on it being that it shall pertain to the qualifications of the applicant for the practice of dentistry. I remain, very respectfully,

O

H. J. HAMLIN, Attorney General.

Ess.

Subsequently to the obtaining of this opinion, the Board sought the Attorney General's advice as to the Board's duty in giving examinations for licenses in other than the English language. Upon this question his opinion is as follows:

March 21, 1902.

Hon. T. W. Pritchett,
Pres. State Board of Dental Examiners,
White Hall, Ill.

DEAR SIR:—Your favor of the 15th inst. at hand. In my opinion the State Board of Dental Examiners cannot be required to examine applicants for license to practice dentistry in any other than the English language. Very respectfully,

O

H. J. HAMLIN, Attorney General.

Ess.

The Board is to be congratulated upon these opinions from the Attorney General, as they clearly define the law as it stands, and give the Board legal authority for carrying out the law as interpreted by them. Surely an era of better things may be looked for in Illinois, as we now have a good law and a capable, trustworthy board.

Notices.

WASHINGTON STATE DENTAL SOCIETY.

The Washington State Dental Society meets at Tacoma, May 22-24, 1902. A large attendance is expected, and several fine papers and clinics are promised. The profession is cordially invited to be present.

EASTERN INDIANA DENTAL ASSOCIATION—CHANGE OF DATE.

The Eastern Indiana Dental Association will meet at Shelbyville, Ind., May 7-8, 1902, instead of May 14-15, as was announced in the last DIGEST.

A. T. WHITE, Sec'y, Newcastle.

MISSISSIPPI STATE BOARD OF DENTAL EXAMINERS.

The Mississippi State Board of Dental Examiners will hold its annual meeting in Jackson on Tuesday, May 27, 1902.

W. R. WRIGHT, D.D.S., Sec'y, Jackson, Miss

VERMONT STATE DENTAL SOCIETY.

The twenty-sixth annual meeting was held at Rutland, March 19-20, 1902, and the following officers were elected for the ensuing year: Pres., J. A. Pearson; 1st V.-P., J. H. Jackson; 2d V.-P., H. Burbridge; Rec. Sec'y, Thos. Mound; Cor. Sec'y, Grace L. Bosworth; Treas., W. H. Munsell; State Prosecutor, J. A. Robinson; Ex. Com., G. F. Barber, G. O. Mitchell, J. C. Hindes. The next meeting will be held at Burlington, Vt., the third Wednesday of March, 1903.

COLORADO STATE BOARD OF DENTAL EXAMINERS.

The Colorado State Board of Dental Examiners will meet in Capitol Building at Denver, Tuesday, June 8, 1903, at 9 a. m., to examine applicants for license to practice dentistry in the state. In addition to written and oral examinations, applicants must supply their own patients, instruments and materials, and come prepared to do practical work. All applications must be completed prior to June 8. For blanks and information address

DR. H. F. HOFFMAN, Sec'y, California Bldg., Denver.

NEW JERSEY STATE DENTAL SOCIETY, COMMITTEE ON ART AND INVENTION.

To all those who during the past year have invented or designed any instrument, appliance, method or operation in or applicable to the art and science of dental surgery:

The New Jersey State Dental Society respectfully solicits you to send a contribution of such article or appliance that you have invented or designed, with a full description of the same. All appliances will be classified and receive due consideration at the hands of the society. We stipulate only that all articles sent shall be of practical value and of general interest to the profession at large. We shall make an interesting exhibit under the head of Art and Invention—one that will be of value not only to the profession but also to the inventors and designers. A full report will be made and printed in the society proceedings. Send contributions by June 24 and not later than July 1, otherwise they may not receive proper classification. All appliances will be well taken care of and returned to the contributors after the session of the society, which will be held in the Auditorium, at Asbury Park, New Jersey, July 16-18, 1903. This year's session will be one of, if not the largest, both in interest and attendance of any previous session of the New Jersey State Dental Society, which is known for its interesting, valuable and well attended sessions.

W. G. CHASE, *Chairman*,
1018 Witherspoon Bldg., Philadelphia, Pa.

MASSACHUSETTS BOARD OF REGISTRATION IN DENTISTRY.

A meeting of the Massachusetts Board of Registration in Dentistry, for the examination of candidates, will be held in Boston, Mass., June 25-27, 1903.

Candidates who have applied for examination will report to the Secretary Wednesday, June 25, at 9:30 a. m., at Harvard Dental Infirmary, North Grove street, and come prepared with rubber-dam, gold and instruments to demonstrate their skill in Operative Dentistry. Any who wish may bring their patients. So far as possible patients will be furnished. The Board in every instance selects the cavity to be filled. Partially prepared cavities never accepted.

The theoretic examination—written—will include operative dentistry, prosthetic dentistry, crown and bridgework, orthodontia, anatomy, histology, surgery, pathology, materia medica, therapeutics, physiology, bacteri-

ology, anesthesia, chemistry and metallurgy, and will be held at Civil Service Rooms, State House, from Thursday, June 26, at 9:30 a. m., until Friday p. m., June 27.

All applications, together with the fee of twenty dollars, must be filed with the Secretary of the Board on or before June 18, as no application for this meeting will be received after that date.

Every candidate for examination must be twenty-one years of age.

Application blanks may be obtained from the Secretary.

Candidates who have taken an examination and failed, and desire to come before the Board again at this meeting, are not required to fill out a second application blank, but must notify the Secretary as above in order to be examined. The fee for third and subsequent examinations is \$5.00.

G. E. MITCHELL, D.D.S., Secretary,
25 Merrimack Street, Haverhill, Mass.

ILLINOIS STATE DENTAL SOCIETY MEETING, MAY 13-15, 1902, SPRINGFIELD.

Program.—1. Annual Address, by the President, Dr. M. L. Hanaford, Rockford. 2. Report of Committee on Dental Science and Literature, Dr. G. V. Black, Chicago. 3. Report of Committee on Dental Art and Invention, Dr. Hart J. Goslee, Chicago. 4. "Dental Nomenclature," Dr. G. Walter Dittmar, Chicago. Discussion opened by Dr. A. W. Harlan, Chicago. 5. "Professional Ethics vs. Patents," Dr. Charles E. Bentley, Chicago. Discussion opened by Dr. C. N. Johnson. 6. "Some of Our Predecessors," Dr. A. H. Fuller, St. Louis. Illustrated with electric stereopticon. Discussion opened by Dr. G. V. Black. 7. "An Ideal Material for Filling Root Canals of Teeth," Dr. Rudolph Beck, Chicago. Discussion opened by Dr. Hart J. Goslee. 8. "Good Fellowship," Dr. C. R. Taylor, Streator. Discussion opened by Dr. Edmund Noyes, Chicago. 9. "Preliminary Dental Education," Dr. M. R. Harned, Rockford. Discussion opened by Dr. A. H. Peck, Chicago. 10. "Conditions Modifying Extension for Prevention," John E. Nyman, Chicago. Discussion opened by Dr. E. H. Allen, Freeport. 11. "Use of Matrix in Compound Approximal Gold Fillings," Dr. Elliott R. Carpenter, Chicago. Discussion opened by Dr. Don M. Gallie, Chicago. 12. "The First Permanent Molar," Dr. J. N. Crouse, Chicago. Discussion opened by Dr. Truman W. Brophy, Chicago. 13. "Dental Conditions in the Philippines," Dr. Louis Ottofy, Manila.

Clinics. Wednesday Morning, May 14.—1. Dr. Charles J. Sowle, Rockford, Ill. Gold filling, using matrix and separating rubber. 2. Dr. Hugh McMillan, Roseville, Ill. Some convenient things about an office. 3. Dr. George W. Cook, Chicago. Individual treatment of pyorrhea alveolaris. 4. Dr. M. R. Harned, Rockford, Ill. Cavities in artificial teeth. 5. Dr. Joseph S. Bridges, Chicago. Porcelain inlay. 6. Dr. J. J. Reed, Rockford, Ill. Cement anchorage for gold filling. 7. Dr. W. T. Reeves, Chicago. Porcelain inlay. 8. Dr. Frank S. Trickey, Freeport, Ill. Gold filling. 9. Dr. Hart J. Goslee, Chicago. Construction of saddle for porcelain bridge.

and carving cusps for crown and bridge work. 10. Dr. R. J. Cruise, Chicago. Extraction and supplantation a cure for chronic alveolar abscess and pyorrhea alveolaris. 11. Dr. B. J. Cigrand, Chicago. A gnathomer mimic, showing the philosophy of mastication. 12. Dr. K. B. Davis, Springfield. Crown and bridge work. 13. Dr. L. O. Green, Chicago. Banded Logan crown. 14. Dr. L. S. Tenney, Chicago. Gold and platinum restoration, using engine mallet. 15. Dr. Chas. P. Pruyn, Chicago. Subject to be announced. 16. Dr. C. B. Sawyer, Jacksonville, Ill. Gold filling in labio-cervical cavity, using a clamp of aluminum, own design. 17. Dr. Elliott R. Carpenter, Chicago. The extirpation of the dental pulp, employing saturated solution of cocaine.

Thursday Morning, May 15.—18. Dr. E. F. Hazell, Springfield. Gold filling. 19. Dr. J. E. Hinkins, Chicago. Subject to be announced. 20. Dr. Winthrop Girling, Chicago. Porcelain crown without facings and porcelain shading. 21. Dr. Calvin S. Case, Chicago. A new form of artificial palate. 22. Dr. Geo. B. Perry, Chicago. A method of mounting and truing wheels for dental engines and lathes. 23. Dr. J. O. Brown, Chicago. Gold filling, Watt's crystal gold. 24. Dr. Hugo Franz, Chicago. Surgical treatment of chronic alveolar abscess. 25. Dr. Edmund Noyes, Chicago. Root filling. 26. Dr. R. C. Brophy, Chicago. Porcelain work, baking with gas and gasoline. 27. Dr. Chas. F. Bryant, Chicago. Continuous gum dentures. 28. Dr. Sydney Knowles, Chicago. Porcelain inlay, Wassall's method. 29. Dr. Frederick B. Noyes, Chicago. Amalgam tests. 30. Dr. G. M. Brunson, Joliet, Ill. A method of anchoring screw posts in frail roots and badly broken down bicusps and molars. 31. Dr. Geo. D. Sitherwood, Bloomington. Treating and wiring loose teeth. 32. Dr. Grafton Munroe, Springfield. Taking impressions or "something prosthetic." 33. Dr. Frank H. Skinner, Chicago. Preparation of sensitive cavities, using nitrous oxid with Hurd's inhaler. Gold filling, using noncohesive gold and tin to prevent thermal changes, finishing filling with cohesive foil. 34. Dr. Geo. Appel, Chicago. Disto-occlusal gold filling, using matrix with gold pads for protecting the enamel and gaining good adaptation of gold to the cavity margins.

MISSOURI STATE DENTAL ASSOCIATION.

The thirty-eighth annual session of the Missouri State Dental Association will convene at Jefferson City, May 21-23, 1902. The literary program will be held in the Legislative Hall, and the clinics, beginning at 10 A. M. the first day, will be held at the State Penitentiary, where an abundance of clinical material can be had. Railroad and hotel rates have been secured. A cordial invitation is extended to the profession to attend. The following is a partial program:

Addresses and Essays.—1. Burton Lee Thorpe, St. Louis. President's Annual Address. 2. Wm. Everett Griswold, New York. "The Griswold System of Removable Bridge Work." 3. Frederick Brown Moorhead, Chicago. "Alveolar Abscess, Its Sequel and Surgical Treatment." 4. D. R. Stubblefield, Nashville, Tenn. "Metallurgy." 5. J. D. Patterson, Kansas City.

"Etiology of Dental Disease." 6. D. F. Luckey, D.D.S., Missouri State Board of Agriculture, Columbia. "Comparative Anatomy of the Teeth." 7. J. Robert Megraw, Fayette. "Dental Prescriptions." 8. Millard Lewis Lipscomb, A.M., Missouri State University, Columbia. "The Practical Application of Electricity in Surgery and Kindred Subjects." 9. S. C. A. Rubey, Clinton. "Some State Board Questions and the Answers they Receive." 10. James W. Hull, Kansas City. "Conservatism in Dentistry." 11. Herman Prinz, St. Louis. "Some of the Newer Dental Remedies." 12. Charles Gilbert Chaddock, M.D., St. Louis. "Neurology." 13. W. W. Flora, Carthage. "Use and Abuse of Crown and Bridgework." 14. Otto J. Fruth, St. Louis. Report of Committee on New Inventions and Appliances 15. H. S. Vaughn, Kansas City, "Orthodontia."

Clinics—M. C. Marshall, St. Louis, Supervisor. 1. Edward G. Snodgrass, Keokuk. Step filling, using Watt's crystal gold. 2. Frederick Brown Moorhead, Chicago. Surgical treatment of alveolar abscess. 3. Wm. Everett, Griswold, New York. The Griswold system of removable bridgework, constructing a practical case in the mouth. 4. R. C. Brophy, Chicago. Porcelain work, baking with gasoline and gas furnaces. 5. B. Q. Stevens, Hannibal. Table clinic, method of root-filling with gutta-percha and wood points, and taking impressions of enlarged or undeveloped root canals. 6. A. J. Prosser, St. Louis. Methods of filling with cohesive and non-cohesive gold and tin foils. 7. F. M. Fulkerson, Sedalia. Immediate and painless pulp extirpation in anterior teeth. 8. R. H. Mace, St. Louis. The use of gold inlays in deciduous and frail teeth. 9. Herbert P. Neeper, Canton, Edward G. Snodgrass, Keokuk. Mounting Logan's crown with cap. 10. F. B. Jahr, Kansas City. Preparing cavities in porcelain teeth. 11. John G. Harper, St. Louis. Table clinic, "Some odds and ends." 12. J. Robert Megraw, Fayette. Treatment of alveolar abscess with fistulous opening and immediate root filling. 13. M. E. Windhorst, St. Louis. Gold fillings. 14. F. H. Achelpohl, St. Charles. The use of Teague's cavity disk cap. 15. J. H. Kennerly, St. Louis. Taking impressions of the mouth. 16. J. Denzil Bowles, Tipton. New treatment for epules, tumors, oral ulcers, etc. 17. D. O. M. LeCron, St. Louis. Porcelain inlays. 18. A. J. Prosser, St. Louis. Gold inlays swaged and burnished. 19. W. F. A. Schultz, St. Louis. Operation for necrosis. 20. R. R. Vaughn, St. Louis. Demonstrating use of cement. 21. Geo. H. Mathae, St. Louis. Extracting with nitrous oxid gas, demonstrating new universal lower forcep. 22. A. F. Strange, St. Louis. Obturator for cleft palate. 23. R. N. LeCron, St. Louis. Construction of porcelain bridge. 24. V. H. Frederick, St. Louis. Bridge work with removable facings. 25. J. S. Letord, Kansas City. Demonstrating a new rheostat for 110 volt alternating current. 26. C. D. Lukens, St. Louis. "Orthodontia." 27. E. F. Fletcher, St. Louis. Something. 28. James W. Hull, Kansas City. Immediate and painless checking of hemorrhage. 29. Geo. H. Gibson, St. Louis. Cleansing a set of teeth. 30. Orme H. Manhard, St. Louis. A method of retaining loose teeth with splints. 31. H. S. Vaughn, Kansas City. Demonstrating the Jackson crib system for irregularities. 32. W. L. Reed, Mexico. Articulated natural teeth to demonstrate

cavity preparation. 83. Henry B. Purl, Kirkville. Black's method of step cavity preparation. 84. W. W. Flora, Carthage. Richmond Crown. 85. Herman Prinz, St. Louis. Demonstrations of some of the newer dental remedies. 86. L. A. Young, St. Louis. Adjusting rubber dam and filling root canals, demonstrating new rubber-dam holder and aseptic broaches. 87. J. S. Letord, Kansas City. Fillings with Vernon's gold and Eoff's gold and platinum. 88. James F. Austin, St. Louis. Cavity preparation for alloy fillings, using "Fellowship" alloy

GEO. W. TAINTER,

Chairman, Jefferson City.

C. D. LUKEN⁴, St. Louis, } *Executive Committee.*
J. C. PASQUETH, Mexico. }

News Summary.

D. D. KIMMELL, a dentist at Bement, Ill., died April 2, 1902.

E. D. LORD, 77 years old, a dentist at Bellevue, O., died March 28, 1902.

E. M. ROFFEE, 64 years old, a dentist at Clyde, N. Y., died March 27, 1902.

M. L. SPEARS, one of the oldest dentists of Augusta, Ga., died Mar. 18, 1902.

PAINFUL IN THE EXTREME.—The man with the gout says that mischief is afoot.

G. R. JOHNSON, a dentist at Hastings, Mich., died March 31, 1902, of measles.

R. G. RAGAN, a dentist at Anniston, Ala., died March 11, 1902, from pneumonia.

A. L. SIDENER, a dentist at Mechanicsburg, O., died March 22, 1902, from heart disease.

CHAS. E. BARTLETT, 85 years old, a dentist at Battle Creek, Mich., died April 15, 1902.

A. J. JACKSON, 78 years old, a retired dentist at Drexel, Mo., died March 11, 1901.

J. J. LARKIN, 31 years of age, a dentist at La Salle, Ill., died April 1, 1902, from peritonitis.

S. TOWNSEND, 65 years old, a dentist at Oakland, Md., died March 24, 1902, from consumption.

M. M. CRISSELLE, 80 years old, a former dentist of Minneapolis, died March 18, 1902, of pneumonia.

EDWARD G. HORNE, 74 years old, a retired dentist at Philadelphia, died of Bright's disease March 24, 1902.

G. V. PICKERING 84 years old, a dentist at Laconia, N. H., died April 9, 1902, after sixty years of practice.

DISTRICT OF COLUMBIA EXAMINING BOARD.—The District Commissioners have appointed W. E. Dieffenderfer of Washington, D. C., to fill the unexpired term of the late Dr. Henry B. Noble.

M. S. BORNEMAN, a dentist at Norristown, Pa., 45 years old, died suddenly March 21, 1902, from heart disease.

A. J. BACON, a dentist, formerly of New Mexico, but now of Denver, is reported dying from consumption.

R. H. GUNNELL, 66 years of age, a dentist at Washington, D. C., died April 5, 1902, from pleuro-pneumonia.

JOHN W. BLAIR, a dentist, formerly of Winchester, O., died at Hartford City, April 5, 1902, from lung trouble.

J. K. GAMBLE, 55 years of age, a dentist at Coffeyville, Kan., died suddenly March 17, 1902, from heart failure.

WALKING FOR HIS HEALTH.—First pedestrian: "Out walking for your health?" Second: "Yes, I am going for the doctor."

F. N. TAYLOR, 50 years old, a dental salesman at Detroit, Mich., and formerly of Chicago, committed suicide March 14, 1902.

MARRIED.—C. A. Bachman, Emaus, Pa., March 30; N. L. Bolles, Marceline, Kan., April 1; Chas. Lewis, Des Moines, Ia., Feb. 25.

STRYCHNIN ANTIDOTE.—Lard given internally is an efficient antidote to strychnin, and it can be found in every household.—*Exchange*.

INSOMNIA.—Says the Scientist, "The way to sleep is to think of nothing." This is a mistake. The way to sleep is to think it is time to get up.

J. A. BREEDING, of Glasgow, Ky., one of the prominent dentists in that section, died April 5, 1902, of pleuro-pneumonia, after 25 years of practice.

E. H. REID, 34 years old, a dentist at Eatonton, Ga., died April 1, 1902, from heart failure. He was dentist to the State Sanitarium at Milledgeville, Ga.

GEORGIA EXAMINING BOARD.—April 8 the Governor appointed Dr. N. A. Williams of Valdosta as a member of the State Board of Dental Examiners, to succeed Dr. E. H. Reid, deceased.

SCATTERED.—Doctor: "Well, did that dose I told you to take scatter your cold?" Patient: "It certainly did. When I saw you last the cold was only in my throat, but now it is scattered all over me."

MASSACHUSETTS DENTAL EXAMINATIONS.—Eighty-three candidates presented before the Massachusetts Dental Board of Registration in Dentistry last month. Forty-three passed and forty were rejected.

PEORIA (ILL.) DENTAL SOCIETY held its annual banquet and meeting on March 31, and elected the following officers: Pres., W. F. Whalen; V. P., R. C. Willett; Secy., L. R. Snowden; Treas., A. J. Myers.

VALENTINE.—A man was recently operated on for appendicitis, but the surgeons discovered that their diagnosis was wrong, so they sent him home on Valentine's Day with a note reading "Opened by mistake."

SHEDDING OF TEETH AS A "TABETIC ARTHROPATHY."—In locomotor ataxia the teeth may fall out gradually and painlessly. The joints, especially the knees and elbows, sometimes enlarge suddenly, as a rule without pain, constituting the so-called "tabetic arthropathies" of Charcot.—*Sajous' Annual*.

PHYSICAL IMPOSSIBILITY.—Mike (to the chemist): "The dochter said, 'take wan of these pills three times a day.' I tuk wan of thim wanst, but the man doesn't live that kin take wan of thim three times."

ASHEVILLE, (N. C.) DENTAL SOCIETY.—A society with this name was organized March 11, 1903, and the following officers were elected: Pres., J. W. Foreman; V. P., J. F. Ramsey; Secy. and Treas., F. L. Hunt.

CENTRAL MICHIGAN DENTAL ASSOCIATION.—This society was organized April 3, at Ionia, and the following officers were elected: Pres., J. J. Green; V.-P., J. H. Armstrong; Sec'y, P. L. Campbell; Treas., C. E. Whitmore.

ELECTRIC TREATMENT.—"Electricity in the atmosphere affects your system," said the scientific physician. "Yes," said the patient, who had paid \$10 for two visits, "I agree with you; there are times when one feels over-charged."

SOUTHEASTERN MASSACHUSETTS DENTAL ASSOCIATION held its annual meeting at Fall River, Mass., April 9, and elected the following officers: Secy., F. O. Kidd; Treas., A. G. Wyman; Ex. Com., T. P. Sullivan, O. J. Egan, W. W. Marvell; Councilor, A. P. Rogers.

FIFTH DISTRICT DENTAL SOCIETY OF NEW YORK STATE held its fourth annual meeting at Syracuse April 9, and elected the following officers: Pres., C. H. Barnes; V. P., S. Slocum; Secy., A. D. Wells; Treas., I. C. Curtis; Correspondent, J. H. Dower; Librarian, F. R. Adams.

SINGULAR FATALITY.—A little girl twelve years old met with a singular death at Brighton, England, recently. In biting an apple she broke a tooth, a splinter from which penetrated near the throat, setting up such profuse hemorrhage that the child succumbed.—*Brit. Jour. Dent. Sci.*

HEMATURIA AND GINGIVAL HEMORRHAGE TREATED WITH TURPENTINE.—In a bad case of hematuria and bleeding from the gums, the latter were painted with turpentine and the oil given internally, with the result that blood ceased to flow from the gums and no longer appeared in the urine.—*Ex.*

BAD EFFECTS OF TESTIMONY.—One of the funniest dental ads we have seen is in a Nebraska newspaper. The dentist states, "I positively extract teeth without pain, as dozens of happy persons will testify, and no bad effects afterwards." We should think bad effects would follow such testimony.

RUBBER AND ALUMINUM PLATES.—The rubber is dissolved in chloroform, and aluminum powder added until the solution takes a creamy consistence. After removing the wax from the flask the model is given two or three coatings of this solution and the flask is closed in the ordinary way.—*Archiv fur Zahnheilkunde.*

APPRECIATIVE.—"Dec. 30, 1901. Enclosed find post-office order for my subscription to the DENTAL DIGEST for 1901-2. Pardon my neglect in not attending to this matter before. You and your journal have done enough for the profession that we should at least keep our subscriptions paid up. L. V. W. Du Puis, Mayville, N. Dak." This is indeed refreshing. Would that all our subscribers felt as he does.

GAS AT REGULAR RATES.—President of the Getyourcoyne Gas Company "Great Scott, Doctor, you don't mean to say you are going to charge me for pulling one tooth." Dentist—"Yes \$1 for pulling the tooth; the balance for gas furnished at your regular rates."

WATER OVERFLOW CAUSES DAMAGE SUIT.—A dentist in Michigan last month carelessly left his office for the night without shutting off the running water. It overflowed and soaked through the ceiling into the stock of a dry-goods store on the floor beneath. A \$1,000 damage suit is in prospect.

SMALLPOX INSURANCE.—Lloyd's, London, issues policies against smallpox since the recent epidemic in London. The policies are issued for two months for \$250 and upwards. The present premium rate is $\frac{1}{8}\%$ for those recently vaccinated; $\frac{3}{4}\%$ for Christian Scientists and others who do not believe in vaccination.

VERSATILE KANSAS.—After all Kansas is the place for live news. A doctor there named Love was accused of having loved and married too many times. The officials were not sure of the evidence, but did not want the doctor to get away, so they jailed him for unlicensed practice while verifying the bigamy charge.

SEVENTH DISTRICT DENTAL SOCIETY closed its annual meeting at Rochester April 9, and elected the following officers: Pres., F. W. Proseus; Vice Pres., F. Messerschmitt; Rec. Secy., C. F. Bunbury; Cor. Secy., C. C. Bachman; Treas., Le Roy Requa. The next meeting will be held at Buffalo the second Tuesday in October, 1902.

PAINLESS REMOVAL OF TOOTH-ENAMEL.—Removing the enamel should not cause any pain worth mentioning. By placing a short piece of rubber tubing which fits tightly around the tooth, and leaving on over night so that the gum may be pressed back, the enamel may be removed quite painlessly without even causing the gums to bleed.—*Dominion Journal*.

DARK JOINTS.—Dr. W. W. France says, in *Items of Interest*, that he protects the joints of his vulcanite plates with about a quarter of a sheet of gold leaf and that he has never had a dark joint since he commenced its use. When the space is small one thickness of the gold pressed in with the edge of a penknife blade is quite sufficient. Tin foil will do equally well.

SIMILIA SIMILIBUS CURANTUR.—"I think," said the vegetarian, "that if a man lives on beef he becomes something like an ox; if he eats mutton he looks sheepish, and if he feeds on pork, he grows swinish." "If that is the case," replied the man who liked a meat diet, "when an individual lives on nothing but vegetables he is likely to become pretty small potatoes."

HEMORRHAGE.—Calcium chlorid, in doses of 8 to 16 grains every two or four hours, should be tried in all forms of persistent hemorrhage, especially hemoptysis, hematuria, and intestinal hemorrhage of typhoid fever, for it increases the coagulability of the blood. It should be remembered, however, that this drug should not be used more than three days continuously for its prolonged use decreases the coagulability of the blood.—*Med. Br.*

ASPHYXIA INCIPIENT.—Always suspect some foreign body or substance in the air passages, and if possible immediately remove it. Arrange for access of fresh air; raise head and upper part of body; remove tight dress, collars, corsets, etc. Irritation to the skin should be produced by sinapisms; stimulate respiratory center by electricity if time allows.—*Merck's Archives*.

DAMAGE SUITS.—A woman in Detroit is suing her dentist for \$300 damages, claiming that he broke one of her teeth. He had previously sued her for \$37 for services rendered, so hers was probably merely a retaliatory suit. A woman in St. Louis is suing a firm of two dentists for \$4,000 damages, claiming that they maliciously extracted some teeth, and broke one of them off close to the gum.

ITINERANT DENTISTRY DANGEROUS.—A man in New Haven, Conn., about ten months ago allowed an itinerant fakir to pull a tooth. Soon after he was unable to open his jaw, and a consultation of physicians discovered that when the tooth was extracted the jaw had been broken. Necrosis set in, and for ten months the man has been dangerously ill. Hopes are now entertained for his recovery.

LITTLE BOBBIE had longed earnestly and long for a baby brother and a pair of white rabbits. The answer to both wishes came on the same morning, but it was not quite satisfactory, for there were two baby brothers and only one rabbit. Bobbie was greatly disgusted at the mistake. The next day his father found the following notice tacked to the gate-post: "For sail—One nice fat baby or i will swap him for a white Rab-Bet."

BLOODLESS SURGERY.—A Japanese physician, Dr. Jokichi Takamino, claims to have discovered the possibility of bloodless surgery through the medium of adrenalin. By the local application of adrenalin in solution operations may be performed, it is said, on the nose, ear and eye without the loss of a drop of blood. This medicament seems the most expensive drug known. It costs \$1 a grain, \$7,000 a pound.—*Pearson's Weekly*.

SUPPURATIVE PAROTITIS.—Dr. Francis R. Packard reports (*Jour. Am. Med. Assn.*) two cases of suppuration of the parotid gland, with pus in the external auditory canal, a condition which he believes must be frequently overlooked by the general practitioner, and by others who have not made a special study of the subject, the pus being regarded as coming from the middle ear instead of reaching the parts, as it does, by infiltration through the incisurae Santorini.

BRUSH IN USE ELSEWHERE.—According to the Taylorville, Ill. *Breeze*, a dentist in that section recently had a very pretty young woman for a patient, but her teeth were badly neglected. As she was leaving the office he told her she must take better care of her teeth, saying, "You should use your brush on them diligently after each meal." "Well," said the patient, "I used to brush them sometimes, but when brother Tom joined the army he took our tooth brush with him."

BACKING TEETH IN CROWNS OR DUMMIES.—In making crowns or dummies it is better to back the tooth first, before any grinding is done, for the tooth

is then stronger and the pins may be well riveted to the backing. If the backing is put on after the tooth has been ground, and the pins have been encroached on by the grinding wheel, a part of the tooth may be fractured when riveting the backing. This would not be the case if the backing were put on first.—T. F. Chupein, *Dental Off. Lab.*

FATAL EFFECTS OF CHLOROFORM FOLLOWING ATTACKS OF INFLUENZA.—William Caldwell draws attention to the importance of obtaining a history of recent influenza before the administration of anesthetics, especially of chloroform; there have been many deaths from chloroform administration, and especially during influenza epidemics; very suspicious cases have occurred which were clearly explained by the depressed condition of the nervous system and of the heart.—*Dental World.*

SEALING ARSENIC IN A TOOTH.—By Dr. A. L. Blackburn, Curwensville, Pa. In applying arsenic in any form to devitalize a pulp there is always some liability of its escaping by capillary attraction. This may be prevented by cutting a small disc of medium stiff paper, coating one side lightly with sandarac varnish and applying coated side directly on the drug. By carefully smoothing the edges it effectually seals in the arsenic and at the same time prevents to a great degree the possibility of pressure on the pulp while introducing the gutta-percha.—*Ohio Jour.*

SETTLED THE BILL.—The following story is told on Dr. M. B. Dennis of Port Huron, Mich. Some time ago a young woman called on him and had a bridge made. Payment was deferred and the patient married. After repeatedly failing to collect the amount, Dr. Dennis wrote the young woman that if she would call at his office he would remove the bridge, as he did not think she would care to wear anything that belonged to some one else. She thereupon became very indignant and had the bridge removed by another dentist and sent it to Dr. Dennis. Now he is wondering what to do.

TOXIC ACTION OF COCAIN.—Dr. Maurel of Toulouse discussed before the Society de Biologie the toxic properties of cocain, and said that the danger accompanying its administration was due to its penetration into the veins, Cocain, he says, changes the shape of the leucocytes from round to spherical. In man the leucocytes are weaker than in animals, and it takes 0.005 milligrams of cocain per kilogram of blood to bring about the change referred to. When the leucocytes become spherical they cannot pass through the capillaries of the lungs, and so form emboli, which cause death.—*Cosmos.*

ILLEGAL PRACTITIONERS.—Last month four dentists in northern Minnesota were indicted for practicing without a license. One at Whatcom, Wash., on April 1 was fined \$50 and committed to jail for the same offense. On April 4 a man at Buffalo was arrested for being minus a license. On March 18 warrants were sworn out for the arrest of five dentists in Kansas City who were practicing dentistry illegally. On April 4 a dentist at Sioux Falls, S. Dak., was arrested for failure to take out an annual license as required by the state law. The case is a test one, as many dentists claim that the annual license fee is unconstitutional.

CANCER OF THE BRAIN.—R. H. M. Dawbarn, the eminent surgeon of New York, has been awarded the Samuel D. Gross prize of \$1,000 by the Philadelphia Academy of Surgery, for success in treating inoperable cases of cancer of the brain. For the last six or seven years Dr. Dawbarn has tied both carotid arteries, thereby lessening the blood supply to the brain and head, with the most satisfactory results in malignant diseases from the pharynx up to the brain. Many cases operated on several years ago are apparently much improved. Our readers will remember that some time ago Dr. Dawbarn described this operation in the *DIGEST*.

FATALITIES.—A man at Wilkesbarre, Pa., died last month while under the influence of ether, which was administered prior to the extraction of three teeth. A young woman in South Dakota last month died from blood-poisoning caused by an ulcerated tooth. A man in Pennsylvania on April 8 died suddenly a few minutes after having three teeth extracted. Death was caused by the bursting of a blood vessel. A woman in Los Angeles, Cal., died last month while under the influence of chloroform which was administered for the extraction of several teeth. A man in Maine died on April 8 from hemorrhage following extraction of a tooth.

THIS IS THE LIMIT.—"Dr. H. J. Sullivan, Wooster, O. member of the Board of Pension Examiners of Wayne Co.," is responsible for the following: Six months before his little daughter was born her mother had two front teeth filled with gold, and now that the child has out her front teeth "it is discovered that two of them have all the appearance of being filled with gold. Dr. Sullivan says that he has cut into the bone and has found that it is apparently of a yellow substance all through. He does not say what seems to be gold is really so, but it looks like it." The gentleman stated to a reporter of the *Pittsburg Dispatch* that he never heard of a similar birth-mark. Neither did we.

ACCIDENTS.—J. B. Moore, a dentist at Lexington, Ky., was seriously injured and burned March 14, 1902, by an explosion of gas in his office, owing to a leak in the meter. O. B. Richards, a dentist at Pittston, Pa., was badly burned by an explosion of gasoline in his office on March 31. His wife, standing near by, was seriously injured. A cylinder of nitrous oxid gas exploded in the office of Dr. M. S. Campbell at Lynn, Mass., on March 29, and did about \$200 damage. A dentist at Springfield, Mass., while making nitrous oxid gas, was badly burned by an explosion of same. A vulcanizer in the office of a dentist in South Dakota exploded one day last month and caused \$150 damages to the room and contents.

ROBBERIES.—On April 10 a dentist at Keokuk, Ia., lost \$12 worth of gold. March 12 a dentist at Carthage, Mo., lost \$80 in gold plate, etc. April 10 a dentist at Quincy, Ill., lost \$25 worth of stuff. March 18 a dentist at Carthage, Mo., lost gold and some dental curiosities, total value, \$140. The same man who robbed a dentist at Bakersfield, Cal. of \$250 worth of stuff on March 9 visited two other offices in that town on the same night, and picked up about \$50 worth of gold and other things. March 14 three dentists at Sacramento Cal., lost gold aggregating over \$100 in value. Other robberies are re-

ported from Fresno, San Luis Obispo, Merced, all of California, and from other cities and states. There seems to be an epidemic of this sort of thing, and we would urge our subscribers to be on their guard.

RESUSCITATION.—M. Ogata and J. Futagawa recommend what they call the stroke resuscitation for asphyxia, and the shaking resuscitation for anesthesia. The former consists of a light stroke over the antero-inferior margin of the chest with the palmar side of the extended fingers, repeated from ten to fifteen times a minute. The respiration is stimulated, the heart's action excited, and the circulation accelerated. Shaking resuscitation is performed as follows: The feet of the child are grasped by one hand and the shoulders held by the other; the trunk is gradually raised, and the head brought near the feet, the body being strongly flexed at the hip-joint, while the chest is pressed with the hand. The head is then raised, the trunk is gradually extended, and the child returned to its former extended position. Thus expiration and inspiration are secured. Should a repetition of this procedure be fruitless, after a moment's pause in the second posture, the hand on the back is suddenly removed, the upper part of the child's body being thus thrown down and shaken. This should be done eight or ten times a minute, and a warm bath given after eight or ten shakings. The authors claim that this method of resuscitation surpasses all others —*Medical Record*.



DEBT NOT PAID.—"What a debt we owe to medical science," he said, as he put down the paper.

"Good heavens," she exclaimed, "Haven't you paid that dentist's bill yet?"

PRECAUTIONS NECESSARY WITH HYDROGEN DIOXID.—Two professors at Lyons, France, have recently called attention to the ready absorbability of hydrogen dioxid and the consequent danger of fatal gaseous embolism from bubbles of oxygen forming in the blood after absorption, when it is applied to an open wound or to detach an adherent dressing. In contact with the blood, as with pus, the effervescence continues. The oxygen is disposed of by the oxyhemoglobin in the blood if the amount is small, and no harm results. Inflamed tissues are peculiarly active in decomposing the dioxid,

and absorption is always slow and gradual in all cases. Crolas advises rendering the dioxid alkaline by adding a saturated solution of sodium borate, a drop at a time, until litmus paper, first reddened by the dioxid, regains its blue color. Even aside from the fear of gaseous embolism the dioxid should always be neutralized, as it is liable to contain more or less sulfuric, phosphoric, or other acids. It should never be used stronger than eight to ten volumes, and always fractioned and in moderate amounts. With these precautions there need be no fear of the slightest evil effects from its use.—*Pacific Medical Journal*.

EXAMINATION OF CHILDREN'S MOUTHS.—Jacob Sobel (*Med. News*) says that the ideal position is to have the back of the child rest against the mother's right breast, its head against her shoulder, her left hand holding the child's knees, her right its hands. The left index finger and thumb of the physician are placed on the infant's temporal region and with the palm the head is held firmly against the mother's shoulder. For illumination direct daylight thrown into the mouth answers every purpose, but shadows must be avoided. Where good light is not available the forehead reflector is used with artificial light. A good tongue depressor is essential. He uses a modification of Chapin's, notched at the end like the broad end of director. This notch is used to engage the frenum in snipping "tongue tie." A systematic examination of the mouth should be conducted as follows: The depressor is inserted at the left angle of the mouth, the cheek and lips everted, then at the right angle, and the cheek and lips everted. The spatula then catches the frenum and the under surface of the tongue, the frenum and the floor of the mouth are observed; the spatula being removed the upper surface of the tongue is viewed; the latter is then firmly depressed and the hard and soft palates, fauces, tonsils, pharynx, and, in the vast majority of cases, epiglottis, are observed.

CURIOUS SYMPTOMS FOLLOWING TOOTH EXTRACTION.—A patient aged thirty years presented himself at the Royal Dental Hospital in London to have a tooth removed which had been fractured in the country a week previously. During the whole week he had suffered great pain, which had ceased only on the morning of the day he came to the hospital. The roots of the lower left first molar were removed without any special difficulty, the patient, however, complaining of excessive pain immediately after the operation. This was speedily relieved by the use of hot water, and the man then seemed quite well. Within from three to five minutes after the extraction he suddenly complained of severe "pins and needles" in the legs, which later affected his arms. The patient assumed a very bad color, and on being placed in a reclining position asked to be allowed to sit up. The whole body became rigid, with strong contraction of the muscles of the forearm and the flexors of the fingers, and adduction of the thumbs. Respirations were hurried, with accompanying stridor; with pulse quick and feeble. The patient was conscious all the time and was able, though with difficulty, to answer questions. The teeth were clenched, the pupils of the eyes widely dilated. Both extremities became quite cold, and had a moist, clammy feeling. He was vigorously rubbed for about a quarter of an hour and recovered slowly until he was able to warm himself by swinging his arms, and he eventually went away apparently not much the worse.—W. Collier Pridham, *Jour. Brit. Dent. Assn.*

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No. 5.

Original Contributions.

ORAL PROPHYLAXIS.

BY DR. D. D. SMITH, PHILADELPHIA. READ BEFORE THE CINCINNATI
ODONTOLOGICAL SOCIETY, MARCH 28, 1903.

In discussing with you this evening matters pertaining to oral prophylaxis—properly the prevention of disease in the mouth, it is my purpose to give emphasis to certain former teachings relating to it, and to present for your consideration some more recent and important observations which materially enhance the strenuous import and the benefits in this new field of research. The first paper relating to this matter was entitled "Prophylaxis in Dentistry," and was read before the Northeastern Dental Association, Oct. 18, 1898. It was the expansion of a talk before the Washington City Dental Society the preceding February.

This paper, the outgrowth of four years of investigation and experimentation in this new field, was published in two of the leading dental journals—the *Digest* and the *International*, but excited little or no comment, and there was no editorial mention. In October, 1899, having added another year to previous successful experience, and having evolved the "annual fee" scheme for the more attractive presentation of this treatment to patients, I gave a talk on the "Business Aspects of Prophylaxis" before the Northeastern Dental Association, and made a practical demonstration of the methods of treatment. This talk, given at the request of one of the members, related more to the business than to the scientific aspects of the subject, and because of this was never prepared for publication.

In May, 1900, it was my privilege to have, on special invitation, two professors from a leading dental college of our city examine some cases from my private practice which had been kept rigidly for about two years under the system of prophylactic treatment herein advocated. About a dozen patients were subjected to careful

examination. The inspection of these cases seemed both a revelation and gratification to these gentlemen, and through them arrangements were at once made to bring the subject before the Academy of Stomatology in Philadelphia, where I read, May 20, 1900, the second paper on "Prophylaxis in Dentistry." This was published in the DIGEST September, 1900, and in the *International* December, 1900. In June, 1901, I read before the New York Institute of Stomatology the paper "Oral Prophylaxis" which appeared in the January, 1902, DIGEST, and in the December, 1901, *International*, and this evening I am permitted the pleasure of reading the present paper before you.

In previous writings I have clearly set forth the fact that tooth decay always begins at some vulnerable *tooth surface* and, piercing the enamel, proceeds along the lines of the tubules toward the pulp. The agencies of tooth resolution or decay are opposed in their progress principally by the structural consolidation of enamel and dentin. A living pulp in a tooth opposing the progress of decay with its vitality is a preserving force scarcely sufficient to demand recognition.

The human mouth is practically a miniature caldron into which all manner of agencies inimical to the teeth find their way. Of these, some pass through without appreciable impression, and some, finding lodgment, play an active and important part in tooth destruction. There are foods, both solids and liquids, foods for nutrition and materials for ferment; there are acids—natural, artificial and mineral; salivary and mucous secretions, varying in quantity and character; there are toxic excretions from mucous surfaces, gums, tonsils, fauces and tongue; there is sedimentary matter from saliva, mucus and liquids, with starch, sugars and oleaginous deposits, all in conglomerate destructive activity. And, as if to heighten and intensify the decay-inducing tendencies of those agencies, the temperature of the mouth, which is maintained at the high normal of 98°, is often raised several degrees above this through the taking of solids and liquids at high temperatures. It would be difficult to suggest combinations or conditions more favorable for bacterial culture and the induction of caries than the usual conditions of the human mouth.

That some teeth are constituted to successfully resist the destructive action of these agencies, while others readily yield to them; o

that the agents themselves are more manifest and virulent in some mouths than in others, does not in the smallest degree militate against the fact that all decay of the teeth begins at the surface. Experiments—empirical or scientific—for producing artificial decay of teeth in man or animals are and must ever be incomplete and unsatisfactory, as each case has its own peculiar environment, and specific investigation alone can determine the cause of it.

Tooth environment is the one condition above every other which demands recognition and investigation at the hands of dentists. Until this matter is satisfactorily investigated, and due attention given to the part which it plays in tooth destruction, decay and rede cay, in spite of "germicides," "cavity preparation," "antiseptics," "filling materials," "extension for prevention," and a host of other specifics, will go steadily forward. That caries is due to tooth environment is readily demonstrable by the test of extraction. If we remove a decayed tooth having a living pulp from the mouth, it is a well-known fact that all decay in that tooth is at once arrested; but to make the test absolutely indisputable, let us take a devitalized tooth, sometimes but improperly called a "dead tooth," conceded to be subject to more rapid decay in the mouth than a similar tooth with a living pulp. Let a pulpless, decayed tooth be removed from a mouth where the environments are such that resolution is rapidly taking place, and let it be placed in water, alcohol or glycerin, or simply exposed in the air, and we know that decay is immediately arrested and that further disintegration comes only with the lapse of years.

It matters not whether decay is due to bacteria, to acids, to electrical conditions, or to all in combination, the *control* of decay is wholly dependent upon the control exercised over environmental conditions. This is no longer theory, for practical operations in the mouth in scores of cases extending over seven years of experimentation have fully proven the power of environment in the induction of decay, and the feasibility of its control has been clearly demonstrated. As the destroying agent is always external to the tooth, the one effectual bar to the beginning of decay is systematic, forcible change of tooth environment from bad to good.

Having reached this statement, permit me by way of contrast, and before attempting further elucidation, to read a short article entitled "Odontology," by Arthur S. Underwood of London, from

a medical journal which came to my notice a few days ago. This has a bearing upon a paper entitled "Recurrence of Caries Under Good Fillings," by Dr. H. A. Smith, which was read before your society in May of last year and published in the February, 1902, DIGEST. Comment upon it therefore seems quite in order and may very properly be regarded as part of the original discussion. Mr. Underwood says, "One of the few interesting contributions to dental pathology during the past year has been a research upon the power at our command to arrest dental caries, from the pen of J. Choquet. His thesis is concerned with the possibilities of antisepsis in arresting caries that has already commenced. He has endeavored to reproduce in the teeth of a live sheep the pathological changes peculiar to caries. With this object he created cavities in the sheep's tooth, and inoculated them with varieties of cultures procured from caries that had taken place under apparently satisfactory fillings. The method he advocates is as follows—The cavity is carefully cleaned, then dehydrated, not with hot, but with lukewarm air, followed by treatment with different strengths of alcohol, gradually rising to absolute alcohol. Then the cavity is dried with hot air, and the alcohol replaced by a mixture of alcohol, xylene, essence of geranium and hydronaphthol. This dressing is allowed to remain for twenty-four hours in the cavity, protected from the fluids of the mouth by a gutta-percha stopping, and the result has been entirely satisfactory; whereas, if the succession of different strength of alcohol had been omitted, the caries reappeared after a certain lapse of time." (This bewildering array of medicaments, with its confusion in methods ostensibly for sterilization of a cavity after removal of decay, is both burdensome and unnecessary, and fastens the impression that the whole process is the highest empiricism. Recurrence of decay *under* a properly made filling is of rare occurrence, so rare indeed that it may be eliminated as a result. If "caries reappears after a certain lapse of time" under or around a filling, the consensus of opinion in the profession in America has been for fifty years and more that such decay is due and directly chargeable to defective manipulation or some untoward condition affecting the operation. The defect may be in manifest imperfection in cavity preparation, or it may appear in lack of control of adverse conditions in the process of filling, or it may be in lack of adaptation of filling material itself, and failure is about as

common in one instance as the other, but "the omission of different strengths of alcohol" in the preparation of a cavity does not enter into the case in the smallest degree as a determining factor. Inefficiency in operating seldom or never apprehends the true cause of recurrence of decay in a filled tooth.) "M. Choquet maintains that the hydronaphthol has no mischievous effect upon the pulp. He concludes by stating that the odontoblast cells secrete an appreciable amount of secondary dentin in eight days. This may be true, but it sounds almost magical in its rapidity. In experimental research of this kind it must always be borne in mind that it is not absolutely safe to argue from the lower animals to man. In the sheep the chemical composition of the tissue is not identical with that of human dentin and enamel, while the arrangement of the pulp tissue, and, in fact, the mode of growth and nutrition, is *profoundly* different; and as the tissues differ, so may their readiness to accept and retain the various reagents vary also."

In Dr. Smith's paper we find some details connected with the experiments of Choquet which were omitted by Dr. Underwood. He says, "A small drop of the bouillon which had been inoculated twenty-four hours with the pure culture was deposited in the bottom of the cavity and covered with a thin platinum cup. The cavity was then filled with cement. All precautions were observed throughout the operation to maintain an aseptic condition. Nine months afterward the animal was slaughtered and the following phenomena were observed—The dentin, instead of being white, was of a yellowish hue and was also softened. The softening, reaching a slight depth, was very plain and more noticeable at the portion of the cavity where the diameter had increased. Thus was demonstrated the *possibility* of producing artificial caries in a living animal."

To the casual observer this would seem to be a case on the order of "original scientific investigation," but on careful inspection I think we shall find it an investigation with the "smack" of science only and a long-drawn-out procedure wholly destitute of beneficial results. Let us examine it for a moment—"A sheep was selected for the experiment because of its *docility* and also the resemblance of the animal's anterior teeth to the human incisors. It cannot be consistently assumed that there is any true analogy between the tooth of a sheep and that of the human incisor. If there is resemblance in composition, there is none whatever in environmental sur-

roundings, nor in the elemental conditions of nutrition, as the human incisor belongs to the omnivora and the sheep's tooth to the true herbivora. In a cavity made in the labial surface of a sheep's tooth a drop of inoculated bouillon was deposited; it was then covered with a thin platinum cup, and the whole—bouillon (moisture) and platinum—was covered in the cavity with cement.

We know absolutely nothing about the details of these operations, but we can imagine something of the difficulties attending them, and the inference of imperfection at every step is perfectly justifiable from the description given. Could the imagination picture anything more at variance with accepted methods of practice than confining moisture of any kind with a cement filling under a platinum cup in a cavity in a tooth! Such an operation would form a combination for the incitement of decay which no tooth, animal or human, could resist. Conditions for the prevention of decay in a freshly made cavity are, exclusion of moisture, perfect apposition of filling material with the walls of the cavity, and imperviousness of the filling material itself. The conditions as described in these experiments are exactly the opposite of this. Infected moisture in a cavity, confined by a platinum cup would render perfect adaptation of the filling material impossible; but all this in the experiment was confined in the cavity, not by an impervious filling material, but by one of the most unreliable bacteria-generating materials—cement—(and we are not even told the variety) in the whole list of filling materials. After nine months the cavity was found softened to a slight depth, and more noticeable at the portion where the diameter had increased (just the point where the filling was most defective) "and thus," we are told, "was demonstrated the possibility of producing caries in the tooth of a living animal." The wonder is not that there was slight decay, but that under such decay-inciting treatment there was at the end of nine months any tooth at all remaining.

Even assuming a fair analogy, and that the operations were conducted in accordance with really scientific methods, and each step accurately and fully tabulated, what educational end has been attained? None at all. The only claim is, that the possibility of inducing decay in the lower animals has been demonstrated. If this were true, and as yet it is far from a clear demonstration, what possible good is to come from it? This paper of Choquet's, in so far

as it has an influence, will stand for imperfect operations on the teeth, and failures, properly chargeable to indifferent methods of operating, will be ascribed to bacteria in the dentinal tubules.

Unless my instincts and conceptions of dentistry are all radically wrong, the object of our profession is *to prevent disease in the mouth* and permanently preserve the human teeth for every service required of them.

The results of demonstrating the possibility of producing caries in the tooth of a sheep are neither helpful nor inspiring. This unsatisfactory experiment will neither add to the sum of our knowledge, increase our usefulness nor embellish our attainments. It is to be regretted that the journals on this side of the water are manifesting a disposition to republish these so-called experiments as in the interests of dentistry.

It seems to have been left to a Canadian dentist, in an article which appeared in an Ohio journal for February, to fill up the measure of our humiliation before the medical and scientific world. This article, entitled "Vaccination a Prime Factor in the Destruction of Children's Teeth," is probably the most illogical, inconsistent and altogether senseless that has ever been published in a journal devoted to science.

Let us now return to the consideration of our original proposition, that caries of the teeth is wholly chargeable to environmental conditions. The foundations of this statement are, we believe, immovable and will stand against all assaults or contradictions. Ultimately it will be determined that not one but many agencies are at work in the production of tooth decay. That there are many favoring conditions and many influences besides the pernicious activity of specific agents to be considered in accounting for the phenomena of tooth decay is a matter beyond question. As there are many grades of tooth structure, so there are many grades of consolidation in tooth material; and these conditions control and are practically independent of the vital principles within the tooth, which opposes but feeble resistance to the encroachments of external agents, of which toxic exudations and the products of bacteria are most prominent and active. We may then assume with confidence that the beginnings of decay are always at the surface of the tooth, and that the cause, whatever we may decide it to be, must reside in the *menstruum* in which the tooth is perpetually enveloped.

At no time perhaps in the profession's history has there been greater laxity or less genuine effort in the direction of prevention, than at the time of the promulgation of these theories of prophylaxis. Text-books and periodical literature, college teachings, society discussions and clinical demonstrations, have without exception been in the direction of *restoration* following the destructive process of decay, all specially emphasizing the importance of *mechanical* appliances and manipulations in dentistry. The principles of prophylaxis have found no consistent advocacy in the profession, neither has there been any earnest effort in the direction of prevention.

As showing the spirit of the profession, permit the following citations—In the discussion following my first talk on this subject in Washington one gentleman said, "I guess we don't need any one to come down here from Philadelphia to teach us to clean teeth." In April, 1900, a much respected professor in one of our colleges remarked to one of his patients: "Dr. Smith has got a great craze for cleaning teeth, but I don't approve of it." One operator said, "It will polish away the enamel from the teeth." (If this man could have comprehended the real effect of polishing enamel surfaces with pumice, and had had the frankness to declare it, he would have said, "With each treatment the enamel improves in character and texture; it becomes more resistant and consequently less liable to attacks from bacteria, acids or any injurious agent." The only "polishing away" that is done is of the agents of resolution.) Another remarked simply, "I don't believe it." Another, expressing his contempt in the language of the street, said, "This cleaning of teeth once a month is all tommy rot." A few, unwilling to commit themselves to an opinion, simply looked wise and smiled. One gentleman, fully convinced of the value of the discovery, delivered himself as follows—"Yes, this is all right, but if I adopt this system and stop decay what am I going to do," making exhibition of a spirit wholly antagonistic to the instincts of true professionalism.

It is a pleasure to record, that since the reading of the paper and the demonstration of cases before the Academy of Stomatology in June, 1900, there has been a marked change in sentiment on the part of the leading men in Philadelphia and other places. The incredulous smile is giving way to thoughtful investigation, and the simple declaration of unbelief is changing to hearty commendation

and approval. Dr. Kirk, after examining a number of my cases which had been under treatment from eighteen months to two years, said, "If our theories of decay are correct, this is the solution of it." A leading professor in the University, after a similar examination of cases, said, "I am thoroughly converted to your views and to your methods of treatment." Dr. Truman, writing Oct. 26, 1900, and later of the paper "Prophylaxis in Dentistry," said, "I regard it as one of the most valuable papers of recent production, marking a decided advance in practice. * * * While it is contrary to our rule to publish as original anything appearing in another journal, I feel that I must set this aside at present, in view of the importance of the subject. * * * I shall be pleased to have you continue this matter for the January issue. I find that if it is desired to make an impression the subject must be repeated over and over again. This, to my mind, is important and *should be driven into professional thought*. * * * I have fully endorsed your method as a system, and only this week in lecturing to my class stated that your system of prophylaxis would in all probability be the ruling practice of the twentieth century."

Permit me to quote from the discussion following the paper on "Prophylaxis in Dentistry." "Dr. E. T. Darby: Perhaps I cannot say anything more valuable and convincing than to testify to what I saw a few weeks ago in Dr. Smith's office. He had present about a dozen patients to illustrate this method of treatment, and when I tell you it was a revelation and an inspiration to me, I express only about half of what I then felt and feel to-night. I have never seen teeth so absolutely clean and polished upon every surface as those that I saw there. I do not recall a single instance of a mouth with any deposit, with the exception of a young man who smoked almost constantly. The teeth seemed to present a peculiar polished surface, which I could liken only to that of a ball polished on a lathe, and their whole character seemed changed. You have all seen in the mouths of some of your patients, where the teeth have been the best, a peculiar polished look which you have not found in the mouth of your average patient—a peculiar ivory-like look of hardness throughout the whole enamel. I saw that in young girls, in middle-aged persons, and in two quite advanced in life in Dr. Smith's office; and it made me very careful about the methods of my patients, and I preached to them as never before. I

have said, 'Your teeth are dirty,' while they might not have been worse than they were at any previous time. Since I saw those cases I have taken better care of my own teeth, and the indirect influence on my patients has been for good. When Dr. Smith says he prevents decay I think he does. I believe that as we remove the bacteria from the surface of the teeth by polishing, as he does, the teeth will not decay. There was only one point I could not understand—how his patients could have teeth so clean upon the proximal, labial and lingual surfaces without the use of floss silk; but they were free from deposit, debris, or anything else, and the gums seemed to cling to the teeth as though they were part of them." Dr. E. C. Kirk: "I am very glad to add my few words of testimony, but I cannot add anything to what Dr. Darby has said. The mouths were free from the irritating effects of the bacteria, and we know infection may manifest itself in many ways. The thing that strikes me most forcibly about what Dr. Smith has accomplished is this, that he seems to be the only man who has actually accepted at full face value the statements and results of investigation of those who hold to the idea that caries of the teeth is the result of the environment of the teeth. Its cause is external to the teeth."

Passing over much of commendation since received from many parts of the country, allow me to make a brief extract from a private letter from Dr. A. H. Brockway to Dr. G. Alden Mills: "I quite agree with your estimate of Dr. D. D. Smith's ideas in regard to the care of the teeth, and think his the most valuable and informing paper that has appeared for a long time. He is on the right track, and this paper should be read in every dental society at least twice a year. You and I of course take it in at once, for it is in the line of our thought and practice, but the great mass of dentists will not appreciate nor greatly profit by it." No member of the profession who has seen the actual results from this system of treatment has had aught but commendation for the conception of it and the methods employed for its successful development.

It may not be out of place here to indicate something of its reception on the part of patients. The recasting of the theories and long established methods of practice which we ourselves have instilled into the clientele of dentistry, through the enunciation of such a radical and revolutionary change of plan as is implied in this system

of oral prophylaxis, has proven by no means an easy task; and in the beginning it was discouraging at times almost to the point of abandonment. Some said at once and without hesitation, "That seems a most sensible method of dealing with the mouth and teeth, and I will adopt it." Others said, "Attend to the teeth once a month! Oh, I haven't time." In but one instance, and that where I insisted on the adoption of the treatment for the benefit of two children, have I lost a patient. In this case, upon urging it a second time, I was summarily ordered to cancel all engagements for the family and forward a bill to date. The loss of this family has been far overbalanced by an awakened enthusiasm and the genuine gratitude of many patients, who are regularly presenting themselves, and acquainting others with the benefits of the system.

The almost complete immunity from decay; the great improvement in color and general appearance of the teeth; the diminished sensitiveness of the dentin; the tightening of many teeth which had become loose; the relief from undue sensitiveness of the gums; their marked adherence to the necks of the teeth; the beautiful color and striation appearing in them; the cleanliness and general comfort of the mouth; the universal improvement in the character of the breath, are all matters attracting notice, inspiring confidence and awakening most lively interest.

The problem in the beginning was how to best induce patients to submit to treatment that a fair test might be made, carrying data in proof of it. Having some youthful patients, especially two young girls, whose teeth were being much injured by seemingly uncontrollable decay, with whom I greatly desired to make proof of the treatment, to eliminate the barrier of expense the proposition was made to care for the teeth by the year for a certain fixed sum, and in the beginning this was just enough to cover the time of the twelve treatments. The contract was simply an understanding that the patients should present once a month, or as often as I might deem best, for treatment. This enabled me to effect a complete change in the environment of the teeth at least once a month; toxic matter, whether in the form of excretion or accretion, was removed from the mouth and teeth at regular intervals, and the internal life of the tooth—the pulp life—was stimulated to a more vigorous activity by means of this process of hand-polishing on the external surfaces of the teeth.

Although this system is diametrically opposed to all former theories, conceptions, and methods of practice, about twenty-five patients were brought under the treatment the first year, and by this means the fact was established that in the most unfavorable condition fully ninety per cent of decay could be eliminated by the treatment and in more favorable conditions all decay was arrested. Wherever this system of oral prophylaxis has found typical exemplification whether in childhood, youth, middle life or old age, most favorable results have universally followed. In every case where treatment has been instituted for the deciduous teeth there has been complete immunity from decay, and the teeth have shown marked improvement in structural composition. Alveolar development also has seemingly been much benefitted.

The unsavory but very unjust reputation which attaches to third molars is due to their practically universal eruption into and continuance in an environment destructive of tooth structure, all of which is averted through this system of prophylactic treatment.

The exaltation by dentists themselves of modern dental instruments, appliances and special methods has engrafted upon the mind of the general public the idea that dentistry is the filling of a decayed tooth, the making of a plate, or perhaps the insertion of a crown of doubtful utility. It would seem at times as though skill in the dentist were thought to be synonymous with the glitter of gold in and on the teeth. Hence the so common use of that barbaric appendage—the gold crown, that inexcusable substitute for a tooth which may be more fittingly characterized as the dental monstrosity of the present civilization. It is so repugnant to all esthetic culture as to render it absolutely inadmissible except as it may serve upon the root of some hidden molar. And this prohibition applies with equal force to its use in cases of bridgework as to individual crowns. The exhibition of gold fillings in the front teeth is wholly unnecessary and the practice ought to be frowned upon until it is abandoned.

Not content with the use of gold crowns on natural roots, there has arisen a "gold capsule implantation"; in other words, a gold root implantation for sustaining crowns and bridges. Clyde S. Payne in the *Pacific Dental Gazette* for October, 1900, says "Dentistry is not behind in the advancement made in modern surgery. I can offer you now with certainty an operation that will

revolutionize the old methods. It is the implantation or insertion of a gold capsule or root, the exact counterpart of a root extracted, or the exact adaptation of a gold capsule to an opening made in the alveolar process of any size or shape for the attachment of a tooth or any number of teeth on a bridge."

What shall be said for the status of dentistry when a journal published in the interest of dental science will lend its columns to disseminate such illogical trash as the above? Who with a sense of the benefits conferred by dentistry in the higher levels of practice can resist feelings of deep humiliation at such exhibitions of the stupidity of ignorance in the name of science?

For thirty years the boast of dentistry has been its rapid advancement, but if we inquire in what direction the answer must be, "Chiefly in the line of mechanics." Instruments have been improved and multiplied; ingenious appliances have been devised, and materials and methods of manipulation have been greatly changed for the better, but disease and decay, with all the attendant suffering and loss, move steadily onward unhindered as under the more primitive and less favored conditions. Is there nothing higher and better, nothing more enduring and more helpful in the destinies of the profession than this ceaseless round of decay and loss, mechanical substitution and repair? We believe that the subject of oral prophylaxis opens a larger field for discovery in science and no less of benefit to humanity.

Concealed beneath the debris of the oral cavity there are factors for evil not to the teeth alone, but to the substructures of the mouth and to the general system; to totally disregard which, as has been and is now done, will in the near future be adjudged criminally negligent. The prolific bacterial products of the oral cavity and the varied obnoxious accumulations on the teeth, resulting from decomposing foods and from the retained exudations of irritated, inflamed and suppurative tissues, are cemented by the viscid nocturnal mucus into a toxic mass not alone destructive to the teeth, but an excitant of pathologic conditions throughout the whole pulmonary and digestive tracts.

Under the caption "Contagion by Speaking or Coughing" an interesting series of experiments to determine the precise conditions under which disease germs are carried by droplets of saliva in speaking, sneezing and coughing is described by Herman Koeniger in

the *Journal of Hygiene and Infectious Diseases*. The main results are as follows: "The author has been able to assure himself that in an apartment where there is no appreciable current of air a person speaking, coughing or sneezing can scatter germs to a distance of more than twenty-two feet. The germs can be carried horizontally in all directions and to a height of more than six and one-half feet. They are even found *behind* the person speaking or coughing. Droplets are emitted when the expired air meets with a certain amount of resistance, hence the dissemination in speaking varies markedly in different individuals. These droplets are really microscopic balloons, having in the center a bubble of air, and when this breaks, the germ, whose specific gravity is high, falls. The dissemination of droplets is most marked after coughing or sneezing, and is specially to be feared in cases of small microorganisms—as the bacilli of influenza, plague, pneumonia, etc. The bacilli of tuberculosis, plague and diphtheria are larger than bacillus prodigiosus, but smaller than bacillus mycoides. The danger is greater as the mouth contains more of the pathogenic microbes. Washing the mouth and repeated gargling diminish the number of diphtheritic bacilli susceptible of being detached, hence this precaution has a degree of utility. Placing a handkerchief before the mouth prevents the emission of droplets charged with tubercle bacilli. In case of pneumonia it would be necessary to wear a mask. During a surgical operation no one present should speak. Measures for prevention may be multiplied indefinitely in response to this idea of scattering infection through droplets of saliva."

Here we find recognition of the fact of mouth infection, but no appreciation of the true methods of relief. Germicides will not—cannot accomplish it. Temporary suspension, as placing a handkerchief over the mouth during a surgical operation or in cases of exposure to zymotic diseases, may be of some benefit, but the only effectual relief is to be found in complete and positive eradication of bacteria and all conditions favorable to germ culture from the mouth. This is only change of environment and environmental conditions.

It is a matter yet to be recognized that relief and immunity from infection from these sources are to be afforded through the intervention of dental science alone. It may now seem to some as an unguarded statement, but it will yet be demonstrated that much of the nephritis, uremia, and many cases of bronchial and catarrhal

troubles, as well as the infection of consumption, have their origin in the retention of the exudations from oral tissues with their attendant accumulations on and about the teeth. These conditions are as yet wholly disregarded in dental diagnosis and in medical practice.

I have no sympathy with or belief in the theory that alveolar pyorrhea is constitutional in origin, or that it is in any sense a condition of gouty diathesis. Pyorrhea is wholly local in its origin, and becomes constitutional only as its poison is introduced into the blood by the perpetually vitiated oral emanations and secretions. Contagion from toxic matter on the teeth and in the mouth has in waking hours a short and direct route into the blood through the digestive tract, and one equally direct by the pulmonary tract in sleep. That practice which maintains the most perfect sanitary conditions of the mouth and teeth will best conserve the general health. I have no case under treatment which has not been benefited in the general health.

One of the most notable of the beneficial results of the prophylactic treatment as herein outlined is the elimination of offensive odors from the breath. It is a result to be looked for in every patient, young or old. The time will surely come when it will be an offense, intolerable and inexcusable, for one to appear, as is now so common, with a breath emitting contagion, through lack of proper attention to the mouth and teeth.

I have spoken of the prophylactic treatment as a process to effect and maintain complete change in tooth environment; and such it is, and the beneficial results are in direct ratio with the accomplishment of this result and the perfection with which it is maintained. It consists in the *forcible* and *positive* change of tooth surroundings from bad to good; from harmful to beneficial; from acid to neutral; from culture-producing plaques on the teeth to a germ-freed immune surface. But is this feasible or practical, or is it a scheme of the imagination only? In answer to this let me here give some attention to the methods pursued. Briefly stated, treatment of the teeth for complete change of environment consists in thorough removal at frequent and regular intervals—once a month has thus far proved most satisfactory—of all accumulations, whether solids, inspissated excretions, semi-solids, or bacterial formation, from all the exposed surfaces of the teeth, leaving the enamel, or

whatever of the tooth may be exposed, thoroughly polished and thus in the best condition to void hurtful deposits and equally to favor all efforts of the patient in the direction of cleanliness.

It is readily demonstrable that to secure and maintain true cleanliness in the mouth, even on the part of the most painstaking, is impracticable if not impossible without the direction and assistance of an expert and intelligent operator. There are calcific deposits constantly increasing; the more immediately hurtful acidulated bacterial accumulations; inspissated mucus retaining decomposing particles of food and furnishing most favorable conditions for bacterial culture and the retention of excretions, not alone from the gum margin, but from the whole gum surface. Besides these, there are irregularities, formations and positions inaccessible to all ordinary methods of cleansing, which implies the perpetual retention of matter inimical to the teeth and gums. These injurious accumulations with their equally injurious emanations, hitherto overlooked and disregarded by physician or dentist, are not only causes of decay, but are equally causes of gingivitis, absorption of alveolar structure, and recession of gums, which latter conditions are far more to be dreaded.

Recognition will yet be made of the important fact that to the *presence* of foreign matter on and about the teeth, rather than to the *quantity* of it, the beginnings of decay and pyorrhea are wholly attributable. The deleterious influence of a breath perpetually loaded with offensive emanations from this source, especially during seasons of salivary inactivity, as in sleep, will ere long be disclosed as an important factor in many pulmonary and digestive disorders, and will be taken account of in medical diagnosis and treatment.

Many who have given the matter but passing notice seem unwilling to believe that for the accomplishment of this object there can be any distinguishing difference between wheels operated by power and the orangewood sticks and pumice in the hand, guided by educated intelligence. To such it may be said, a true comprehension of this treatment necessitates abandonment of all engine wheels and a resort to the hand use of the orangewood sticks and pumice *alone*. In the rapid revolution of polishing wheels by power, acquirement of that stimulating energy in the tooth which is a characteristic of the hand process is impossible, and the important after-effects are entirely wanting. The delicate sense of touch is lost through the

wheel, and the surfaces treated will receive the force of the polisher uncertainly and unevenly. The wheel cannot be carried to the festoonings of the gums, the point where treatment is most needed, without injury to them. On account of the involuntary contraction of the orbicular and buccal muscles and the encroachment of the tongue, often accompanied with profuse flow of saliva, obstacles to the use of the wheel in many situations, as on the lingual faces of lower molars and bicuspid, especially in children's mouths, become insuperable. The mechanical difficulties alone, coupled with lack of adaptation of the power polishers, if there were no other reasons, point unmistakably to the diagnosing touch and the delicate use of the hand instruments.

They furnish the only rational means yet devised for the successful removal of the secretions, excretions, and any and all accumulations from the necks of the teeth and from exposed tooth surfaces; for polishing the teeth; and, last but not least, for the stimulation of the vital functions within the teeth to a condition of normal activity. No wheels, no medicament nor medication; no system of cleansing suggested to nor practiced by patients, will accomplish this end. It must be done by educated, skillful dentistry, enforced and repeated as a vitiated environment may demand it. The time limit thus far found to produce the most satisfactory results for the arrest of caries is, for frail temporary teeth, two to three weeks; for adults, once a month.

The benefits of this treatment may be summarized as follows: 1st. The arrest of caries of the teeth. This will be partial or entire in proportion to the frequency and thoroughness of the operation. It was decay alone which in the beginning we sought to combat, and the proven results are such that in all cases the arrest of caries in all parts of the mouth is predicted with a firm confidence; with an assurance one feels in the arrest of decay by means of a perfect filling in an individual cavity. In the teeth of some children under fifteen years of age who are under this treatment there have been in the four years a few new cavities, but I cannot recall a case where a new cavity has appeared in connection with the teeth of an adult. I am satisfied that more frequent treatment and stricter methods for the patient would have reduced the few cases in these young people, all of whom had extremely frail teeth, but all are now improving in character. The treatment will greatly retard but

nor prevent redecay under old, imperfect fillings. Strange as it may seem, delicate, deciduous teeth are even more responsive to the treatment than the permanent teeth. Where full control of the case has been given, no single instance of new decay in these teeth is now recalled.

In the case of a boy with extremely delicate teeth who has been under treatment two and one-half years, the record is as follows: At the beginning of treatment, three years of age, five cavities were filled. First year, treatment regularly every two weeks, except month of August. Second year, and to the present time, treatment every three weeks. Result: Redecay under an amalgam filling teeth at present in perfect condition, with first permanent molar just appearing.

In cases of erupting teeth constant oversight and great care are needed. The record in these cases has been one of almost complete exemption. In a number of instances where the first permanent molars erupted under the old regime, and decayed on the occlusal mesial, distal and buccal faces (and in one instance on the lingual as well), the second permanent molars, erupting into a better environment, are without decay and in perfect condition. Similar observations may be made from my experience with third molars. In young adults and in patients in middle life under this prophylactic treatment there has been no new decay and the teeth are constantly improving in appearance and in texture.

2d. A decided change for the better in the color of the teeth. This improvement can have but one explanation—it is the result of the stimulation due to the treatment, the vital activities within the tooth taking up and removing the old, effete, stagnant matter in the tooth-substance and replacing it with new and better material. The change in color is from an opaque, old-ivory appearance to that of clear, translucent, polished enamel, the whole giving the appearance of increased density and general improvement, denoting decay-resisting structure: the apparent stimulation from the treatment rapidly changing the color of the tooth, diminishing its sensitiveness, both externally and internally, and greatly improving its quality; changes which have impressed and astonished the author as perhaps no other results from operations on the teeth or in the mouth have ever done.

Prognosis in this matter is always good. In a number of instances

it has caused the dark brown stains in the dentin of roots uncovered by gum recession to be taken up and replaced by a perfectly normal tooth color. White spots on the labial faces of front teeth, indicative of interrupted enamel nutrition at that point, have greatly changed for the better under this treatment and in two cases the teeth have resumed a normal aspect. Other instances might be cited in evidence of the nutritive changes beneficial to the teeth, which are the undoubted result of the stimulation from this treatment.

3d. It greatly relieves sensitive conditions so commonly found in the gums at their margins, and it seems a corrective for highly sensitive dentin. Cases of filling or refilling which have been found necessary where the mouth was under this treatment have certainly suffered much less from the pain of excavating than before the treatment was instituted, and ligations for rubber-dam applications have been effected without pain.

4th. It reduces the vascularity and undue color of the gum tissue and arrests perfectly all gum recession due to local irritation; it induces festooning and striation of the gums and causes highly sensitive gum tissue to assume its normal condition of low grade sensibility.

5th. It has proven a corrective for many unnamed inflammatory conditions which, although troublesome and annoying to both patient and dentist, have been treated with a degree of indifference by the operator and suffered as a necessary condition by the patient.

Reference is here made to such troubles as alveolar fistulas opening on the gums, and having periods of purulent activity, with slight pain and little swelling, but attended with troublesome inconvenience; and to roots which may have been crowned, but from accumulation of irritating exudations at the cervical margins have become loose and sore to pressure. It has been to me a surprise and gratification to see these conditions without exception take on healthy action—fistulas to close; teeth to tighten, and the gums to change from a congested or inflammatory state to a condition of normal sensibility, striation and festooning.

6th. It may be said without fear of successful contradiction that this treatment is absolutely the *preventative* of pyorrhea; and further, it is the natural method of cure where it exists. The theory that pyorrhea is of constitutional origin, dependent on the

presence of uric acid in the blood, is not in accord with clinical observation or experience, and is without substantiation in fact. Pyorrhea is a disease of local origin due wholly to the retention of toxic matter on and about the teeth. It may be heightened by constitutional tendencies, and it may present constitutional effects, but the former are themselves engendered by the disease. My conviction is firm that constitutional expression never precedes the local irritation but that it is always dependent upon it, and the failure to apprehend incipient causes is responsible for the confusion and dread which shadows this trouble in the minds of the profession. What proof so indisputable to establish the local origin of pyorrhea as the fact that whatever good impression has been made through treatment has been by the use of local means and methods alone. The many and varied instruments for the removal of deposits; the painstaking and persistent efforts of the honored and lamented Dr. Riggs, and the multiplicity of remedies (medicaments) all point to the one origin. The beginnings of pyorrhea are not marked by any violent uncontrollable attacks, but are rather the gradual growth of the progressive enmity of a lurking foe. That it is that gradual gum exudations, undisturbed oral concretions and the gathering of food particles commingle and unite at gum margins in a work of irritation, which is in every case the first cause of pyorrhea.

Oral prophylaxis as here advocated is the one rational preventive, as it is the one remedy for the developed disease in all stages and under all conditions. When wasting of alveolus and gum tissue has not progressed to uncontrollable loosening of the teeth, frequent and persistent prophylactic treatment, supplemented by the use of germicides and mild antacid protective remedies, warrants in every case a favorable prognosis.

A TERMINOLOGY SQUIB.

BY WM. A. MILLS, D.D.S., BALTIMORE. READ BEFORE THE ASSOCIATION OF DENTAL SURGEONS, BALTIMORE, JAN. 16, 1902.

To accurately impart information or ideas only definite or significant words should be used, otherwise they are misnomers. Members of none of the learned professions are oftener guilty of violating this rule than those of the medical and dental sciences. The writer is not excepted. The following words are but a few

the many which are often misapplied and misinterpreted, some of which lack clearness of meaning: Life, pathologic, pathogenic, marasmus, alterative, sterile and its branches, aseptic, asepsis, antiseptis, irrigate and its branches, media, mechanical and environment. In some cases words are coined and have no authority for their creation or use.

Analysis is here given of a few which are commonly misapplied by the dental practitioner. Words from the root *sterile* mean—a condition of being infertile, or the rendering incapable of all putrefactive matter. *Aseptic* and *asepsis* mean—a condition of nonputrefaction; absence of all septic matter or pathogenic microorganisms. Can such conditional terms as these be verified when applied to treatment of the oral cavity? No. Instruments, liquids, etc., can be truly said to be sterilized, aseptic, or in a state of asepsis, when they have been processed by fire or with a high degree of heat—a temperature so intense that all living organized tissue or protoplasm brought in contact with it would die. As such absolute conditions are impossible in treating any part of the human body, these appellations are not apropos. The words which should be used are those having their origin in *disinfect*, which means—to cleanse from infection; to purify from contagion; also *antiseptic*, which means—opposed to or counteracting fermentation or putrefaction.

Words having their beginning in *irrigate*, which means—to lead water to, have their correct signification only when it has reference to water alone and not to medical mixtures. The exact word to apply in such cases is *medicated*, which means—to tincture or impregnate with healing substances.

Media is the plural of the Latin noun, *medium*, and means—the middle, middling, ordinary, etc. The medical definition at the present time is—the soil upon which anything grows, especially a substance used for cultivating bacteria, culture or nutritive medium. Why this word is used instead of the Latin noun, *pabulum*, is not stated. *Pabulum* means—to pasture, to feed; the means of nutriment to animals or plants.

The word *mechanical* is almost universally used when referring to devices or appurtenances used in prosthesis. *Mechanical* means—done by a machine, or without conscious mental exertion of will. This is not an appropriate word, but *prosthetic* is, which means—

to make or apply an artificial part to supply a defect of any part of the body, or any device used in treating diseased or abnormal conditions.

Why is it that so many philologic blunders are made? Is it due to ignorance? No, not in all cases, but more to a spirit of carelessness and heedless indifference as to the proper application of words, the lack of definite ones, and the hereditary habit of clinging to antiquated terms which in many cases have outlived their usefulness. The classic Greek and Latin words with their prefixes, suffixes or terminals are the most precise for giving full descriptions in their respective languages; but when made to do service in English, by prefixing, wedging in or terminating with French, or a conglomeration of syllables from still more foreign tongues, seem very incongruous and grotesque when analyzed. For example, take the word *environ* or *environment*, which is to-day so glibly used by all conditions of men that it has almost become a slang phrase.

Dr. Kirk says, "The tendency to generalize, to express conditions by formula, to seek out the natural law expressive of the relations of phenomena, seems to be a necessary quality of the human mind, yet one which frequently gives rise to error and difficulty. Certain forms of expression serve to obscure the idea they are intended to convey, and because of their inherent lack of clearness tend to perpetuate errors of meaning." This shows there is a lack of true descriptive terms, to give full and perfect expression to the many advances made in the science of medicine and its collateral branches, hence the necessity for more progressiveness in medical and dental appellations.

Dr. Bond says, "Medical terms and definitions, including dental are not to be regarded as accurately stating the nature of things but simply as descriptions which may serve for practical purposes." Such a statement may have been acceptable to those living in the past, but to-day is the time of *positiveness*, and the use of abstruse terms is not satisfactory to the philosophical mind. A word to the wise is sufficient.

EXTRACTS FROM AN OLD JOURNAL.

BY MCFERRAN CROW, D.D.S., VERSAILLES, KY. READ BEFORE THE KENTUCKY STATE DENTAL ASSOCIATION, MAY 14-16, 1901.

In looking through the library of my friend, Dr. Wm. Wasson, I found an old volume of the *Dental Register*, published in 1861.

Among other things of interest it contained some correspondence relating to the early history of dentistry that I thought would be worth reproducing. I have copied the letters verbatim as follows:
Dr. Taft, NEW YORK, November 3, 1860.

DEAR SIR:—In a letter received from you under date of Oct. 27, you request me to inform you of the first use of plaster of Paris models for the forming of plates to the same to receive artificial teeth, as far as I am informed.

My grandfather, Isaac Greenwood of Boston, Mass., practiced the making of artificial teeth there many years previous to the Revolution, but from what I can gain as to information, he never used plaster of Paris to make models of for either plate or bone work; he made his teeth out of the sea-horse tooth (hippopotamus), and used merely a bees-wax mold, as did my father, John Greenwood, who practiced in New York from 1790 to 1820.

He was the particular dentist of General George Washington, as expressed in a letter from him to my father, dated Mount Vernon, 6th Jan. 1799: "If you should remove to Connecticut, I should be glad to be advised of it and to what place, as I shall always prefer your services to that of any other in the line of your present profession." There is a pair of false jaws with human teeth on *now* in the head of President Washington, "in the tomb at Mt. Vernon," made by my father, John Greenwood, in 1799, and they are made with the bone gums—I think of the *elephant's tooth* "ivory," and made from molds of beeswax.

My brother, Mr. Clark Greenwood, deceased, and myself did not use plaster of Paris until about 1820, and I think it was through my own suggestion. "We hardened them by dipping the plaster molds in boiled linseed oil, and let them dry." Before that time white and yellow bees-wax was much in use for plate and bone work, even for half and whole sets of teeth. I never had a set returned to me on account of the fit. And I think I was the first in New York who set natural human teeth on bone gums and colored the gums to life, after those made for Gen. George Washington in 1799. I was the first, about the year 1823, to use the *steel* bur in a lathe which I invented, and had made for me in New York by a Mr. Morgan, a Scotchman, for excavating the cavity for the gums to rest in, in parts of and whole sets of teeth. And I claim the first use and discovery of wooden pivots, to be used in bone or mineral

teeth. And the first mineral teeth seen by me were brought to the country by Colonel Aaron Burr, whose dentist my father was, and presented to him by the Colonel. * * * In the first years of my practice metallic pivots to teeth were used, and screwed into the material of bone or human teeth (or sea-horse, sheep or oxen) and cotton was wrapped around the metal pivots to keep them in the sockets of the roots, which, when decomposed, would give an offensive odor; and with me it was a great point to endeavor to find a remedy to prevent these bad effects, and to keep the teeth sweet and clean as possible, which I soon was able to remedy, thus: About 1825 I was operating to fasten a single tooth for an English gentleman, the root of which had been "bushed" with bass or soft maple, to enable the pivot of gold to retain its place firmly, for which, after being well fitted to the cavity of the root, the wooden plug had been perforated that the gold pivot might rest in it firmly. Finding that the wood answered the purpose well, and that very little odor or smell arose from the wooden plug, the idea suggested itself to me that wood might be a proper medium to use for pivots to teeth instead of metal, and if I could procure a wood that would answer my purpose, I should have gained the point desired. After considering, I concluded to use hickory wood, well seasoned and dried, and straight grained white part, and I had the good fortune to procure some straight grained white, which had been used by a baker in the making of bread; some ten years in use. * * *

My father was the first to use the "foot-drill," and he made it himself from an old spinning-wheel of my grandmother's; and since his death I myself have used it, the same one, altogether in my practice for twenty years, and have it yet. I never had seen one before and I know the hand-bow-drill was always used before. I never used the hand-bow-drill to perforate the roots of teeth for pivots, etc., nor in any way, but a drill instrument with a spear-shaped point, gauged for the depth of the pivot, to drill the roots to receive the wooden or metallic pivot. But to make the hole to receive the pivot in the tooth, I always use the foot-drill, and in drilling pieces of bone or ivory I could, with the drill made of the finest needles, meet the drill hole an inch apart. The hole for pivot of wood in the false tooth and for the hole in the root should fit exact with the hole in the draw plate you drive the pivot of wood through. I was the first dentist to have mineral teeth prepared

with holes in them to receive wooden pivots. Hoping this may be of use to you, I am, dear sir, Yours respectfully,

ISAAC JOHN GREENWOOD, D.D.S.

Dr. J. Taft,

NEW YORK, Nov. 14, 1860.

DEAR SIR:—In your letter to me of the 9th of November you request me to give you some information of the early history of dentistry in the United States; and how far my relations were concerned before myself in the profession; and in what manner they gained their information relative to the science? From what I have been enabled to gather from my father and relatives, all I can inform you of is, that my grandfather, Isaac Greenwood, who was born and lived at Boston, and was the first practitioner of dentistry in the family, was the remaining son of Isaac Greenwood of Boston, professor of Natural Philosophy and Mathematics in Harvard College. He was about the year 1750 a mathematical instrument maker, and ivory and wood turner, umbrella manufacturer and dentist. He followed all these professions at the same time, and made the first electrical machine for Benjamin Franklin; my uncle Isaac told me so, and he was apprentice with his father and eldest son. Where my grandfather procured his information in dentistry it is impossible for me to say, and I presume his practice was confined to the mechanical portion; although in his portrait (large as life), taken some time after this, he is depicted with his left hand and arm resting on an open volume of Hunter's *Treatise upon the Human Teeth*, which portrait and treatise I have in my possession. The specimens of the teeth then made by him are very rude, imperfect and ill-shaped, merely a piece of sea-horse tooth formed to suit the space to be filled up, where the natural teeth were wanting, and a separation or slit made with a file (the enamel of the piece of sea-horse being ground white), with no manner of attempt at formation or imitation of natural teeth. They were not, in some instances, arched on the top, and were fastened with thread or wire, silver or gold. * * * Two years before the practice of my father in New York the following advertisement occurs in *Rivington's Royal Gazette* of New York, for August 24, 28 and 31, 1782: "Teeth—Any person who is willing to dispose of his front teeth, may hear of a buyer by applying to No. 28 Maiden Lane, for which a generous price will be given. N. B. Four guineas will be given for each tooth." The above teeth were, no doubt, required to be replanted into the cavities of

the alveolar process, to take root there and supply the loss of the ones to be eradicated for the operation. I have in my possession a skull with an under jaw, left side bicuspid, which has been inserted or engrafted in this way and taken root, or attached itself to the process. This skull was brought from Paris by my father, John Greenwood, about 1806, where he went to procure a keg of natural human teeth.

That dentistry was practiced prior to the Revolution in the Provinces of America, we learn from the following—*The Constitutional Gazette* of April 24, 1776, Boston, after stating that the body of Gen. Joseph Warren had been reinterred at Boston on the 8th, states: "The General's remains were found on the fourth instant, about three feet under ground, on Bunker Hill. They were known by two artificial teeth, fastened by gold wire," etc. If the above information can be pleasing to you, or as information to any one in the profession, you can take what you please of it, as you may depend upon anything which I write you upon the subject, as far as I am informed. With respect, I am, dear sir, yours, etc.

ISAAC J. GREENWOOD,

No. 142 West 14th street, City of New York.

I hope these extracts will interest some of you. Personally I enjoy reading anything pertaining to the early history of the profession. Dr. Wasson also has in his possession a tooth supposed to be of the extinct mammoth, which was picked up near New Madrid, Mo., in the locality of the sunken lands, caused by the earthquake in 1811. The tooth is a molar with five cusps, four double and one single. It is petrified and weighs between six and seven pounds. The crown measures eight inches antero-posteriorly, and the largest root is about ten inches from crown surface to end of root. It has three roots, a large, medium, and small, the latter broken off. The width of the crown is four inches.

PUTRESCENT PULP ALMOST FATAL.

BY W. T. MCKENNEY, D.D.S., Beaver Dam. READ BEFORE THE KENTUCKY STATE DENTAL ASSOCIATION, MAY 14-16, 1901.

The patient was Mrs. T., wife of Dr. T., a prominent physician. She was thirty-nine years old, mother of four children (the youngest four years old), robust in appearance, but rather inclined to the nervous temperament, and previous to present illness had enjoyed

good health. She was suddenly seized with a severe pain in back of head and neck. Her husband adopted the usual line of treatment, but the pain continued to grow worse from day to day and was greatly intensified by patient assuming erect position. Dr. T. became alarmed and called Dr. N. and other physicians in consultation, who also were at a loss to know the cause of the pain and why it did not yield to treatment. This state of affairs continued for nine weeks, during which time there was no temperature, no periodicity, chilly sensation, nor sweating, which was conclusive evidence that the trouble was not due to malarial toxemia; neither were there any signs of paralysis nor loss of sensation, either localized or general; pupils of the eyes were normal and responded to the light readily; the secretions were normal in quantity and regular, so by exclusion meningitis, pachymeningitis and spinal troubles could be eliminated.

In the course of his wife's illness Dr. T. had nine physicians to see her, and all were puzzled for a diagnosis. At this time I was called to see a patient at the house of Dr. T.'s father, and there heard the history of the case. I remarked that the teeth should be examined for the cause, and was at once asked to call. I did so, and the nurse informed me that Dr. T. was absent from home, but she invited me to see the patient, which I declined to do. Next day Dr. T. wrote Dr. M. that his wife had spent the worst night since her illness, and hearing of what I had said, he requested Dr. M. to bring me with him. We went and I found the patient very nervous and suffering intensely, pulse feeble, much emaciated and very weak. I examined her teeth and found the right inferior second molar had a large cement filling on the posterior approximal surface, and was very tender on pressure. On further examination found tenderness at the posterior dental foramen. The patient told me she had been troubled greatly with the tooth when first filled and again when she was first taken with present illness. I felt justified in extracting the tooth and so informed the physicians, who told me to go ahead, but the patient was very weak and could not have her head raised above the level of the body without being crazed with pain. I feared nervous shock, but as it seemed a matter of only a few days before the patient would succumb unless relief should be afforded, I prepared to operate. With great care and difficulty I placed my arm under her neck until I could grasp her

chin with my left hand, and then cautiously extracted the tooth. As I anticipated, the shock was great, but she rallied soon and said, "I am better now." I found a putrescent pulp. From the moment the tooth was extracted she began to improve, and made a complete, rapid and uneventful recovery.

The physicians in charge did not like to give a dental surgeon all the glory of her recovery, so as time developed the fact that the menopause had taken place, or at least that the menstrual flow had occurred only two or three times after her recovery, their theory was that her illness was all due to change of life and not to the offending tooth. With my limited knowledge of the physiological disturbances that may arise from the menopause I am inclined to the opinion that the suppression of the menses at this early age was probably the result of the severe and prolonged nervous shock caused by the tooth. Dr. T. also informed me that her urine was heavily loaded with uric acid during the greater part of her illness—a symptom I always find when a patient is suffering with neuralgia traceable to the teeth and of long duration.

I will quote from a paper by Dr. W. H. Whitslar on Dental Neurology: "The fifth cranial nerve, called sometimes the trigeminus, resembles a spinal nerve, it being compound in its functions, arising from two roots with a ganglion upon its posterior root. This nerve and all its dependencies are therefore subject to its excitement or depression by vaso-motor or trophic changes, as well as the so-called sympathetic relation with other nerves." It is thus easy to perceive that other organs than those contained in the mouth are subject to the derangement due to dental origin. This would include most frequently the eyes and the ears. Afflictions of the larynx, alimentary canal, heart, and even uterus arise because of dental irritation. Authentic cases of hip disease related to dental diseases are on record.

A PLEA FROM A PROFESSIONAL STANDPOINT FOR INVENTIVE INGENUITY.

BY C. W. MCGUIAR, D.D.S., MUMFORDVILLE, KY. READ BEFORE THE
KENTUCKY STATE DENTAL ASSOCIATION, MAY 14-16, 1901.

In selecting this theme I have two objects in view. One is a desire to depart from the list of stereotyped subjects common to dental societies in general, and to briefly divert attention to one

which has been no small factor in advancing dentistry to the enviable position it occupies among the recognized professions. The other is to bring out discussion upon this topic, with a view to ascertaining why there is so large a number of dentists, usually of high-toned, intellectual proclivities, and frequently of long experience in practice, who manifest a deep-rooted and unnatural antipathy toward an instrument or appliance, no matter how meritorious it may be, if it be patented, or in other words, if the inventor has been legally granted an exclusive title to the product of his own ingenuity.

It would hardly be fair to attribute this opposition to prejudice, for certainly there can be no grounds for such in view of the benefits already accrued from the use of patented inventions relating to dentistry. Neither can it be attributed to selfishness, for we all know that professions do not harbor this demon. Finally, it can hardly be due to the slight increase in the price of patented inventions, which is usually within reason, considering the expense necessary to keep them up to a standard of accuracy and uniformity. From a dozen or more flimsy and weakly supported reasons I am able to find but one which has any apparent justification, and this is embraced in a sentiment borrowed from the professions of medicine and surgery, from which is evolved the idea—"That in order that dentistry may not be hampered by any restrictions in the treatment of those organs which come under its care, it becomes the duty of a dentist to give to his profession that which he may originate or invent." If not exact, this is at least the essence of this stray notion.

Here I deem it proper to state that my allusions to inventions imply specifically those instruments, machines, tools and similar appliances indispensable to the dentist, for I believe that our profession almost as a unit is opposed to patented methods and processes, and justly so. But in our antagonism we must not confound method with the means or aids whereby methods and processes are carried out, lest in our condemnation we accomplish that which will hamper advancement. If you are not in the habit of drawing this distinction, it is time to do it and to discard your invariable rule, because you can't adhere to it and keep up in the pace that is being set.

The sentiment as outlined above being, so far as I am informed, the only basis around which the followers of this tenet can rally, I will endeavor to point out the weakness of their position, and then to defend the cause of inventive ingenuity, which, instinctively

timid and retiring, is often unappreciated. In the first place, the borrowed part of this sentiment is inapplicable to dental inventions, the whole merely appealing to feeling and not to reason. Assuming an invention to possess decided advantages in obtaining desired results in a given case, I would ask the question, "When is the dentist most hampered in handling the case, before or after the creation of the invention?" Before its creation he had no alternative but a resort to means more or less tedious and uncertain. After its introduction the only thing which hampers him is "the price" with which to procure the improvement.

If it can be successfully argued and proven that dentistry has been hampered in its service to the public by desirable and useful patented inventions, then I must admit that those of the opposition have one good reason for their position, but I cannot admit it if they simply arch their brows and exclaim, "Oh! but the medical and surgical professions don't indorse it." Away with such subserviency! With due respect for their traditional, dignified views, why need we borrow precept from them? When we mend a broken instrument or forge a new one we do not courtesy to the blacksmith. When the medico steps over the line, with a legal license in one hand and a pair of one dollar universal forceps in the other, and extracts or breaks off a tooth, he does not apologize to the dentist or the surgeon. Then because we employ a few medicaments or draw a little blood in the treatment of those organs which should properly come under our sole care, who says that we should render acknowledgements to the physician or surgeon?

In the second place, admitting for the sake of argument that the sentiment is applicable to the class of dental patents to which I refer, and that we are specialists of medicine with inseparable views upon this subject, let us see why the parent profession is opposed to patents affecting it. Originally reference to the professions implied specifically the law, theology and medicine. They were called the three learned professions and for many generations were esteemed and respected as such. These three, honored and dignified by master minds through centuries, wrought unto themselves ideals and customs which were hard to break down, as evidenced by the fact that it required a revolution to determine that a people had a right to govern themselves; the persecution and torturing to death of thousands of the steadfast and faithful to establish a Protestant

religion—and there are to-day many men in the medical profession who do not accept the accumulated evidence that certain diseases are due to the presence and morbid influence of living organisms.

Congenial association disseminates habits, and habits form semblant character. Thus it appears that when the patent law became operative, and it was evident that medicine would be more or less affected, the primary attitude of the profession toward the system may have resulted as a protest against such a measure as being fruitful of radical departures from trodden paths. I say this may have been the primary reason, but we know that medicine really has another just and sufficient cause for its opposition. I refer to the hundreds of patented compounds, nostrums and cure-alls which, by being legalized, have wantonly and unscrupulously invaded the field of professional medical practice, and are a thorn in the flesh, constantly irritating and aggravating to the members of a worthy and honorable calling. Of a truth, medicine has been hampered from this source by patents, but I am informed that relief is in sight and that it is now very difficult to obtain patents for medical compounds, since the Patent Office holds that they do not involve invention, being no more than prescriptions that a physician might write.

With reference to surgery, it is but fair to note that it is of late years emerging from the ban of the antipatent influence, because it is fast learning that there is more hampering without than with the aid of patented instruments.

Being unable to find any further use for the borrowed part of the sentiment, I would suggest that we gracefully acknowledge the loan and return it to the medical profession for safe keeping.

Thus we come to that part of the expression which has been ingeniously molded to a nice adjustment—the charitable feature! For downright audacity, pure and simple, it takes all the prizes. I must repeat it—“In order that dentistry may not be hampered by any restrictions in the treatment of those organs which come under its care, *it becomes the duty of a dentist to give to his profession that which he may originate or invent!*” Does not that capture a whole conservatory of flowers? Have I garbled the quotation? I am unable to find the sum of it in print, for none seems willing to subscribe to it, but I give it in substance, if not verbatim, as often heard from reputable dentists of my acquaintance. It would really denote more sincerity on the part of the disciples of this belief and

be more becoming to them, to simply refuse to patronize or tolerate patented inventions.

Is it a dentist's duty to give to his profession that which he has created, originated or invented? If he did such a thing, what would be the incentive for devoting his time and money to the development of his idea, when it might be more profitably devoted to his practice or other matters? Does the dental profession solicit alms from this source, and if the source is fruitful in response, will the dentists be equally generous with the profits accruing therefrom and see to it that the wolf is kept from the door, that the coals burn brightly in the grate, and that approaching old age hath no terrors for the kindhearted one who gave his time, the fruits of his ingenuity, and his life to them; and will they finally erect a shaft, above the simple mound and inscribe thereon—To the memory of

———, DENTIST, GENIUS, PHILANTHROPIST?

I believe it is estimated that but one in every seven in the human family is a producer, and if this be true the other six are pensioners upon the sweat of one brow. It is safe to say that not more than one in every thousand is endowed with the genius of original conception and there are fewer still who have also the talent of execution to the extent that they can put to practical use that which they have conceived. If this be true, it naturally follows that the overwhelming majority of mankind is indebted to a few men for the lightening of many burdens, the dissipation of many cares, and the enjoyment of many luxuries which are directly the fruits of inventive ingenuity.

I said indebted, but the debt has been paid by the enactment of a measure which provides legal protection for that small minority who think while others sleep, who conceive while others dissuade, and who accomplish what others have not. It is known that we are an energetic, alert and progressive people; that we can seize an opportunity and turn it to advantage, and that with sufficient incentive we can reduce to practical utility elements unharnessed and problems unsolved, and it was to develop this natural capacity that the patriotic body of American law makers, having faith in our ability, gave us the existing Patent Law, which rewards inventive ingenuity by guaranteeing to it for a term of years the exclusive right to its own product. It was an honorable means to the accomplishment of an honorable end, and who will undertake to say that

the result has not justified the act. It seems to have inspired investigation all along the line by holding out hope of reward.

Without undertaking to enumerate what has been accomplished within the last half or even quarter century in professional realms by scientific research resulting in proved and refuted theories, applied principles and practical developments, it is but stating a truth to say that the strides have been marked and rapid. Nor is it less true with regard to the humbler callings, the trades, and in the manufacturing and commercial world, for they are quite abreast of the tide. Out from the crest of this gigantic wave reaches the hand of genius, clearing the way and beckoning eagerly, that thrift and prosperity may follow.

Hope of reward has inspired many minds to activity, and demanded more thorough preparation in technical channels. Education has set its foot at the throat of superstition and ignorance is no longer excusable by poverty. Science has shed light into darkness, and doubt has been well-nigh routed by demonstration. Crude methods, processes, machinery and appliances have been simplified and perfected by the hand of invention. Though there is nothing new under the sun, the old takes on a new garb and glistens with a new light. In it all shines the soul of genius, without which were no achievements, no results, no knowledge. Ingenuity is an offspring of genius.

Annals teach us that for long years dentistry groped in mist and was plied by whoever chose, but about the middle of the last century willing hands seized the helm, brought order out of chaos, sailed into port, dropped anchor alongside the older professions, and flung her pennant to the breeze. To-day she is being saluted from all quarters, which condition is due to no one thing so much as to her mechanical equipment, supplied through the agency of inventive ingenuity. With this equipment she is able to take the rostrum and declare that by and with these things she obtains results, the isms and scisms of theorists to the contrary notwithstanding.

In time of war our government rewards its soldiers and sailors for deeds of valor by speedy promotion and medals of honor, and in an emergency no nation can rally its forces more quickly than we, but the reward of promotion and medals alone does not suffice, for annual appropriations must be made to furnish pecuniary reward for its host of fighters.

Reward in the form of praise, applause or honorable mention is not sufficient for the necessities of everyday living, but must needs be of a substantial nature, else only those born with a silver scythe may hope to reap. Reward, I say, bestowed in this manner will not suffice to secure the best practical results of inventive ingenuity, for other pastures are broad and verdant and offer both wealth and fame.

For all those professional duties required of us day by day and year after year, suppose our reward to be but a measure of fame as expressed in the thanks and esteem of a grateful clientele—would not the ranks soon be deserted? Would you have it understood that you require no fee, but that you desire only approval, appreciation and praise?

I have read somewhere that every decade brings shorter hours to those who merely work, but for those who would succeed there is no time-table. Do not for a moment think that it did not require study, toil, patience, skill, perseverance, faith, hope and charity—all of these and even money to develop and reduce to practical utility many of the convenient instruments and appliances which are so indispensable in our work, making it possible to display whatever artistic skill we may possess. It is not in behalf of every little worthless invention, the creation of a curious whim, that I appeal, for the stamp of disfavor soon brands such, but for those that are a success, and that indicate the detail of a master hand. Without the incentive of intrinsic reward it is doubtful if any of them would ever have materialized, for they were patented, most of them by practising dentists who thought to lighten the work of their fellows and at the same time lay by something for future needs.

At this, the beginning of a new and portentous cycle, man hardly dares predict its possibilities. I believe that in the future as in the past dentistry will in a large measure owe her advancement and progress to inventive ingenuity, and as a liberal and ambitious profession she cannot afford to stifle and ignore such a fruitful source.

Discussion. *Dr. J. W. Wallace, Louisville:* I entirely agree with the essayist, and believe we should give our aid and encouragement to those who have inventive ability. These things should not be considered alone for us and the present, but also for the future and for those who come after us. In years past the profes-

sion has been hindered by false ideas on this subject, but as time advances more liberal and generous views are held along this line.

Dr. N. T. Yager, Louisville: This paper possesses peculiar interest for me, as I was once placed in a position where I did not know what to do, having invented something, and not knowing whether I should give it to the profession outright or try to benefit by my work. I believe that if we can present something to the profession which will lighten their labors, and at the same time can benefit ourselves, it is the proper course to take.

Dr. Henry Pirtle, Louisville: The essayist is quite correct. Some years ago a member of this Association invented an appliance to aid in the treatment of pulpless teeth, and gave it to the profession. The dentists, however, did not appreciate it, so he had it patented, and it is now used all over the United States. I believe all inventors should be remunerated, and I further believe that all useful appliances should be patented.

Dr. E. T. Barr, Bowling Green: Many of our useful inventions come from young men, often of limited means, and instead of discouraging them by saying that it is unprofessional for them to patent and benefit by their inventions, we should encourage them to take this very step.

Dr. H. B. Tileston, Louisville: There is no room for argument. If useful appliances were not patented they would never get into our hands in proper shape. The man who invents a thing is the one to receive the reward.

NEW APPLIANCES AND METHODS.

BY DR. F. H. LEE, D.D.S., AUBURN, N. Y. READ BEFORE THE ROCHESTER DENTAL SOCIETY, JUNE 11, 1901.

The year passed has been as prolific as its predecessors in additions to our appliances, methods and remedies. These are too numerous to describe in detail, so I will mention only the more prominent ones and some which I have tried. Who of us has not had his patience and skill tried in endeavoring to subdue severe pain following the extraction of a tooth, in what is termed by some "dry socket?" These cases are usually the result of extracting a tooth which has been sore, with inflamed surrounding membrane. I have had great success in treating such with orthoform. One application generally keeps the pain under control for several hours, and

another can then be used. It also gives good results in acute pulpitis, and is antiseptic in action, causing the wound to heal promptly.

For hemorrhage after extraction, or for bleeding gums after grinding roots in fitting bands, the suprarenal extract is the best styptic, clean in use and prompt in action. When an anesthetic is needed at the same time, wiping the gum around the tooth or root with suprarenal added to chloretone, a preparation made by Parke, Davis & Co., is equally efficacious.

For hypodermic injection in painless extraction a five per cent solution of nirvanin is very effective, prompt in action and non-toxic in effect. A number of new methods and remedies have been recommended for root canal treatment, but I think nothing can take the place of the Callahan method, followed by any favorite filling.

A unique operation has been done by Dr. M. L. Rhein of New York, which consists in amputating the palatine root of the superior molars, when these teeth are loose, and substituting a fac simile in porcelain which is cemented to the body of the tooth. Dr. Rhein claims that the usefulness of the tooth is prolonged by steadying it in the socket. This certainly is a beautiful operation, and will greatly benefit the tooth, but I fear it will not become universal, owing to the exactness of skill and technique required.

The use of dry powder of peroxid of sodium, recommended in septic pulp canals by Dr. Charles Peters of Syracuse, overcomes the objection to using the solution, which is very difficult to make. After adjusting the dam or napkin, a dry broach is dipped in the powder and worked into the canal. This is repeated until you are satisfied that the root is sterilized, and then the contents of canal are saturated with a five per cent solution of sulphuric acid, the effervescence of which forces out all debris.

To restore a badly decayed root to usefulness for a crown, Johnson & Lund furnish a drill, tap and small German silver tube threaded on one end. After all decay has been removed, the root is drilled and tapped, the little tube screwed in place, and amalgam packed around it. A pin is then inserted in the tube and the crown attached, giving good results in these troublesome cases.

Verily, we must be on the verge of the millenium, for not satisfied with implantation of teeth in the jaws of his patients, Dr.

Payne of New York goes one better, and after drilling a well, as he calls it, in the alveolus, he inserts a silver tube with a cap on it. In about two weeks, when nature has healed the wound, he inserts a continuous gum tooth with cement. A gentleman from California performs the same operation, but uses a gold tube instead of a silver one. With a wheel bur he cuts a groove around the bottom of the well, inserts the tube, fills it with non-vulcanizable rubber, and with a plugger forces it in tightly, which causes the gold at the bottom to fill in the groove, thus fastening it firmly in place.

Several new detachable crowns have been advertised in the journals, but the ideal has yet to come—one that will be universal in adaptation and easily replaced.

Porcelain inlay work seems to be advancing and improving, and will soon be used extensively. It will of course find no place in the cheap parlors, unless it be used as a bait to draw the multitude, after which some substitute can be palmed off.

The danger of contaminating gold for fillings by exposing it to the naked flame is overcome by several annealers, some heated by electricity and some by alcohol. All are effectual, but the latter are the cheaper, and the claims are just as broad.

TO RELEASE PLASTER IMPRESSIONS.

BY D. L. ABER, D.D.S., PITTSBURG.

How often after we have taken plaster impressions do the patients complain that they thought we would pull the whole top of their heads off in getting the plaster out of the mouth—that it was worse than having the teeth drawn, etc. The impression adheres to the mouth because the plaster while setting absorbs the moisture from the tissues. The remedy for this trouble is as follows—When taking an impression let the plaster set quite hard, say from three to five minutes. Then hold up the lip and place the nozzle of your water syringe between the muscular tissue and the edge of impression, and gently force a little water between, repeating the operation all around the impression. In nine out of ten cases it will drop down without any pulling or even touching with the hand. This method may not be new, but I have used it for some time with great satisfaction to patients as well as to myself, and some dentists may be benefitted by the suggestion.

Digests.

ERYSIPELAS FOLLOWING EXTRACTION. Dentists do not see the patients who die in hospitals of septic pneumonia; the death certificate says "pneumonia," and no more is known. But those of us who trace it from the original history find many a case that goes on to desperate conditions because of the removal of a tooth, because the bacteria at its root were in a state of active proliferation. In most cases where abscess is progressing at the end of a root, I believe the fluid collection of pus becomes sterile in a few days because the bacteria, walled in by phagocytes, pour out so much toxin that they commit suicide with it, and then it is safe to do anything with the tooth. But while the bacteria are progressing and developing rapidly we must know that these cases are dangerous ones; we must handle them with the greatest caution. Yet I have seen many a case coming in with violent inflammation. I saw a patient about two weeks ago with violent streptococcus infection coming from the extraction of a tooth. My impression is the patient died shortly afterward. It was sent to the hospital as a case of erysipelas. The patient was almost moribund. It would have gone down in the death statistics of this city as erysipelas. Nothing more would have been heard of it if I had not been sufficiently interested in the matter of oral surgery to ask if she had had anything done to her teeth, and learned that she had had an ulcerated tooth removed, and this erysipelas followed. Dentists would have known nothing about it, and physicians would have known nothing about it excepting that it was a case of erysipelas. When we are all graduated from the same college, when we all work from a common basis of principles, then we shall have better records of such case-histories.—Dr. T. R. Morris, *Cosmos*.

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HOLLOW SADDLE BRIDGE OR DUMMY. By D. S. Oman, D.D.S. I have often heard it said that it is impossible to make a hollow saddle bridge or dummy without leaving an air vent to allow for expansion of air. I will try to explain how this can be done. First get a metal die of the ridge where the saddle is to rest; proceed in the ordinary way, using platinum for the saddle or next to the gum. Stiffen it with 22 karat solder. Stiffen the occlusal sur-

face or cusps with 22 karat solder and long scraps of gold. This is to keep the solder from leaving the cusps. Stiffen the buccal surface the same way. Swage the lingual side, using number 32 or 34 gauge, 22 karat, leaving it a little longer mesio-distally. Wire in place and solder from the inside with 18 karat solder, being careful not to let the solder leave the joints. *Do not stiffen the lingual side.* Close the mesial end first by sawing a notch in the buccal side and fitting a piece of 30 gauge as close as possible, turn over the protruding end of the lingual side, thus holding the end piece in place, drop in sufficient 18 karat solder and a little borax. Solder over a Bunsen flame. The next step will be to close the distal end; it is done the same way as the mesial. Before fastening on the end piece, put in 18 karat solder and a little borax; after it is closed, wire it, to be sure that it will not move. Now hold over Bunsen flame and see that solder comes through the joints; you will notice at this point that the lingual side is convexed; this is caused by the expansion of air. As soon as it is cold you will find the lingual side is concave; this is caused by the vacuum formed. If this does not take place, you will find there is a leak. The lingual side can be contoured by investing the piece in fire-proof material and flowing solder over it.—*Headlight, Jan., 1902.*

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COHESION OF GOLD. By C. A. Hawley, D.D.S., Columbus, O. Read before the Ohio State Dental Society, Dec., 1901. The practice of good operators has varied much in regard to the character of instruments used for packing cohesive gold. Some have advocated a sharply serrated plugger, some those with fine serrations, and others instruments with no serrations whatever but with the condensing surface smoothly polished. The experiments made by Dr. Black a few years ago plainly show that ordinary gold fillings in the bicuspid and molars will not withstand as great a crushing force as they are likely to receive in the mouth. Clinical observation shows the same thing, though some of the failure is undoubtedly due to improper preparation in the cavity. In the anterior teeth, even if the strength were not necessary, we should have as perfect cohesion as possible to obtain a filling that will take a smooth, fine finish and retain a surface free from pits and scaling. In view of these facts, I have attempted by a series of experiments to obtain some definite knowledge of the value of different instruments for packing gold.

For this purpose I had made a steel cavity block similar to the one used by Dr. Black in his experiments on amalgam. In the first two series of fillings an attempt was also made to test the value of three different forms of gold: pellets, ropes and tape. In the first series twenty-four fillings were made. Three different pluggers were used, one sharply serrated, one with fine serrations and the third polished smooth. The points were rectangular, 1.32×1.6 of an inch, and of exactly the same size. The mallet was a Snow automatic, kept at the same force of blow for each, and the screw governing the stroke marked so that any slipping or accidental turning could be detected at once. The blow in this series was made rather light, as the fillings were small, and no particular attempt was made to get accurate adaptation to the cavity walls. The fillings were made in the square cavities $.085 \times .085$ of an inch.

Twenty-four lots of gold of two grains each were weighed out, twelve lots of No. $\frac{1}{2}$ cylinders and twelve of tape gold. The tape was made by folding No. 4 foil until it was sixteen leaves thick and cutting to a convenient width for the cavity. The same manufacturer's gold was used in all the experiments. It was all well annealed on a sheet of mica over a small Bunsen burner and the annealing made as uniform as possible. The fillings were started by covering the entire bottom of the cavity, using hand pressure with the same point that was to be used throughout the filling. 208 blows were given each filling. In the fillings made with pellets I found that each lot had thirty or thirty-one pellets. Twenty-six were set aside for malleting, and the remaining four or five, as the case might be, used for starting. Eight blows were used on each pellet, making the 208 in all. The tape gold was cut into pieces about an inch long, and in using was folded back and forth with the plugger after the usual manner of manipulating this form of gold. The pieces were counted and the 208 blows distributed between them evenly. Eight fillings were made with each plugger, four with pellets and four with tape. The amount of gold had been so adjusted that the cavities would not be quite full, thus preventing any overlapping and consequent liability of destroying the serrations of the point of the hard tempered steel of the block. As soon as a filling was made it was removed, the uneven surface left by the plugger dressed smooth with a fine file and placed in a small pasteboard box, numbered and record made. It was assumed that the

cohesion obtained would show by the density or specific gravity. The specific gravity of cast or hammered gold has been determined at 19.4 and the difference between the specific gravity of the filling and 19.4 would show the amount of air space it contained.

The specific gravity of the fillings was determined by Prof. F. A. Fish of the Ohio State University. It was found that the usual method of determining specific gravity by weighing in distilled water was not available, as the difference in the amount of water displaced by the fillings was so small that it could not be calculated, so the method of finding the volume in cubic millimeters and dividing by the weight in milligrams was used. Each dimension was carefully taken with a micrometer, the filling weighed and the specific gravity thus calculated. The results are shown in the following table:

SERIES I.

No.	Kind of Gold.	Kind of Plugger.	Specific Gravity.
1	Pellets	Sharp serrated	14.1
2	Pellets	Sharp serrated	13.4
3	Pellets	Sharp serrated	13.8
4	Pellets	Sharp serrated	13.9
5	Tape	Sharp serrated	14.5
6	Tape	Sharp serrated	14.0
7	Tape	Sharp serrated	13.7
8	Tape	Sharp serrated	14.2
9	Pellets	Fine serrated	14.3
10	Pellets	Fine serrated	14.4
11	Pellets	Fine serrated	15.2
12	Pellets	Fine serrated	15.3
13	Tape	Fine serrated	14.5
14	Tape	Fine serrated	14.3
15	Tape	Fine serrated	15.0
16	Tape	Fine serrated	14.8
17	Pellets	Smooth	15.4
18	Pellets	Smooth	14.8
19	Pellets	Smooth	15.6
20	Pellets	Smooth	15.6
21	Tape	Smooth	15.1
22	Tape	Smooth	16.1
23	Tape	Smooth	15.8
24	Tape	Smooth	14.8
Average, sharp serrated 13.9. Average, fine serrated 14.7. Average, smooth 15.4. Average, pellets 14.5. Average, tape 14.4.			

It will be seen that while the difference in the fillings is not large, their density increases steadily as the sharpness of the serrations

decreases and is greatest in those made with the smooth instrument. Note also that the specific gravity of the densest of those made with the sharp serrations is lower than the lowest of those made with the smooth plugger.

As for the test of pellets and tape, the difference is so small that advantage can scarcely be claimed for either. The fillings were so small, however, that one was rather at a disadvantage in using tape, as it was somewhat difficult to fold it back and forth smoothly.

In the next series of six fillings the same pluggers and the same methods were used, except that new slides for the block were made, having two round cavities 9-64 of an inch in diameter. One of the cavities, the one in which the fillings were made, was 11-64 of an inch deep, and the other, which was used only to hold them while the surface was dressed smooth, was 7-64 deep. Two fillings were made with each plugger, one with tape and the other with ropes of gold. The ropes were cut into pieces about an inch long and were made by rolling about one-fourth of a sheet of No. 4 foil. Eight grains of gold were used in each filling and 620 blows struck. The mallet was set to a little harder blow. The results are shown in the following table:

SERIES II.

No.	Kind of Gold.	Kind of Plugger.	Specific Gravity.
25	Tape	Sharp serrated	13.8
26	Ropes	Sharp serrated	15.9
27	Tape	Fine serrated	16.1
28	Ropes	Fine serrated	14.7
29	Tape	Smooth	16.8
30	Ropes	Smooth	16.0

Average, sharp serrated plugger 14.8. Average, fine serrated plugger 15.4.
Average, smooth 16.4. Average, ropes 15.55. Average, tape 15.56

The average of these fillings shows again the density of the fillings increasing as the serrations decrease. The test of the different kinds of gold is again negative, indicating that with the same manipulation the form in which the gold is used has nothing to do with the density of the filling.

Another series of six fillings was made in the same cavity slides. The test of the different forms of gold was abandoned and all were made of No. $\frac{3}{4}$ pellets. Seven grains of gold were used in each filling. 910 blows were struck each filling or fourteen to each pellet after the filling was started. As the points, 1-32x1-64 of an inch,

were rather small for the cavity, $\frac{9-64}{16}$ of an inch in diameter, the points were changed and two of bayonet form, such as are in general use, were selected. One of them was ground smooth and polished. The faces of each were round and exactly $\frac{3-64}{16}$ of an inch in diameter. The blow of the mallet was again slightly increased in force. As will be seen by the averages this series presents the most decided difference between the smooth and serrated pluggers. The result is shown below:

SERIES III.

No.	Kind of Gold.	Kind of Plugger.	Specific Gravity.
31	Pellets	Serrated	13.5
32	Pellets	Serrated	12.7
33	Pellets	Serrated	12.3
34	Pellets	Smooth	16.1
35	Pellets	Smooth	15.8
36	Pellets	Smooth	14.9

Average, serrated point 12.83. Average, smooth point 15.43.

It will be noticed in the first series of fillings that the density is not very high and not so uniform as might be expected. In the way of comment on this fact I might say that the mallet was not set to a very hard blow and it is not the instrument I would select to make a very dense or uniform filling. It was selected for these experiments because it is the only one in which the force of the blow can be made uniform. The density of the last series of fillings was especially disappointing. The blow was about as hard as could be used in the ordinary case on the teeth, and fourteen blows to the pellet ought to make pretty thorough condensation. It is possible that the more thorough malleting with the serrated plugger comminuted or broke up the gold instead of promoting cohesion, but this would not be the case with the smooth plugger. We must remember too that the size of the pluggers was about doubled.

These results as a whole point to the conclusion that serrations have no value so far as the cohesion of the gold is concerned. Cohesion is a molecular force acting at insensible distances between the molecules of a substance, and the more smoothly and closely the surfaces or particles are brought together the stronger the cohesion. Anything that comminutes the surface lessens the force. The use of serrations then, in a general way, is limited to the prevention of the instrument from slipping, especially in pluggers in which the condensing face works at an angle with the handle. They should in all cases be as fine as possible.

The fact that gold will weld in the cold state is due probably to its lack of oxidation and its softness, which makes it possible to drive its particles into such close adaptation that the two surfaces come within the range of molecular force. Lead and tin are soft and have cohesive properties when freshly cut, but a coating of oxid soon forms on contact with the air which interferes with the close adaptation necessary. Tin retains this property longer than lead.

There is one instance in which sharp serrations will assist in the union of two layers of gold. This is in the case of noncohesive gold or gold which has become slightly moist and refuses to stick. We have in each of these cases a coating on the surface which interferes with cohesion. Here the sharp serrations will drive through one layer into the other and bring the fresh cut and uncontaminated particles together. There is probably some mechanical union also. The workers of noncohesive gold found that deep sharp serrations effected a union of this kind between the layers of the noncohesive gold.

In the beginning of these experiments I thought that perhaps the density of the fillings could be shown by rolling them out very thin and examining the texture of the resulting plate. For the purpose of preliminary testing I made two fillings in the square cavities, one by hand pressure with a serrated plugger and the other with a smooth plugger and hand mallet. The first tested specific gravity 13.1, the second 17.3. Very little difference could be seen after rolling out. The pressure of the rolls seemed to make the condensation uniform.

In making the filling with a hand mallet my assistant was instructed to use about the same force of blow as in ordinary work in the mouth. A plugger 1-32x1-64 of an inch was selected, and I judge that the blow would be less painful on a tooth than the blows of the automatic used in series II. The great increase in the density of the filling indicates that there may be some principles worth considering in regard to mallets, though I regret that I have at this time no experiments to prove them.

In the first place, while it requires considerable force to condense gold well, we are constantly reminded that we are dealing with a living sensitive organ, and the amount of force that can be exerted upon it without pain is limited. So we must exert this force upon the gold with the least possible shock to the tooth.

As to the size of the point, while it must always be large enough to drive the gold before it and not penetrate, yet any increase in size beyond this point decreases its effectiveness, for, given a fixed blow, the penetrative force decreases as the area of the surface of the point increases. So the point should be kept as small as possible without penetrating the gold.

Now, what kind of a blow will have the greatest condensing effect? When two masses of matter come together the motion of one is imparted to the other in proportion to the momentum of each. The momentum is the product of the mass by the velocity. A ball struck by a bat has an amount of motion imparted to it in proportion to the weight and velocity of the bat. Given the same mass the energy of the blow or the work done is proportional to the square of the velocity. The penetration of a rifle ball is increased not as its velocity but as the square of the velocity. If the velocity of the ball is doubled the penetration is increased not twice but four times. Applying these simple principles of physics to the mallet in its work in condensing gold we should have a light mallet with a blow of high velocity. The mallet should be light, so as to impart to the tooth but little of its own motion, and the velocity should be high to increase as much as possible the work at the point of the plugger on penetration. That the work can thus be rendered great without imparting motion to the object struck we see in firing a pistol-ball through a pane of glass. If the velocity of the ball is very great a smooth hole will be cut without otherwise breaking the glass, but if the same ball be thrown from the hand the glass will be shattered.

The profession has recognized for years the superiority of the hand mallet for condensing gold. In this mallet we have the blow struck at the end of a long handle, a lever of the third class which gives great swiftness of motion. In most of the automatics that have come into general use we have a steel plunger for a mallet, actuated by a spring and moving up and down inside a metal tube. The friction of the plunger on the sides of the tube and the direct action from the spring prevent a sharp, quick blow. In looking over the sixty or more patents that have been granted for different forms of automatic mallets we find a constant effort to devise some appliance that will give a blow similar to that of the hand mallet. So far those that have succeeded have been too unwieldy to come into

general use and have been superseded by those in which neat appearance and convenience have overbalanced the faulty character of the blow. Of the several engine mallets which have been patented and placed on the market those have been most successful that lift the hammer freely from the plugger and return it with a sharp quick impact. Those that have been made upon the plan of the pushing force of a cam or a series of inclined planes have failed. The blow has not the necessary velocity. Elasticity in a mallet destroys, or reduces by so much as it is elastic, the force of the blow, by increasing the time of the impact. The reaction of the elastic substance reduces the energy by carrying the blow over a longer period of time and is thus a serious defect.

For hand use we must have a mallet of considerable weight because we cannot accurately deliver a blow with great velocity by hand. Steel is an excellent material for a mallet because of its hardness and inelasticity, but it must be used with great accuracy and skill that its smooth surface in contact with the polished end of the plugger does not give a glancing blow, which is of course undesirable. For this reason the lead filled mallet is often used, as its soft surface prevents any glancing and it is not elastic. Lead and tin in equal parts make a composition that is harder than lead, yet not so hard that a blow from it is likely to slip, and it is preferred by many operators.

The electric mallet, so far as the blow is concerned, is probably the best we have. The blow is of very high velocity and the hammer of steel has no elasticity, so we should have very little of its motion imparted to the tooth. Clinical use shows this to be true, for it is well known how gold can be built along frail walls with this mallet without fracturing them. Unfortunately its unwieldy form and high cost greatly limit its use.—*Summary, Jan., 1902.*

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SCIENCE AS A TEACHER OF PROPHYLAXIS. By Samuel A. Hopkins, M.D., D.D.S., Boston. Read before the New York Institute of Stomatology, Oct. 1, 1901. (Copyright, 1902.) I ask your indulgence while I review briefly a paper which I read before the Massachusetts Dental Society last June. The paper which I am about to read is a continuation of same, and as that one has not yet appeared in print, and as it is necessary to the understanding of this paper that you should have some idea of the other, I will give

as briefly as possible a rough outline of some of the statements it contained.

I called attention to the remarkable mechanical and manipulative skill which our profession has attained, and expressed the belief that operative treatment could go no farther. Without decrying the immense good to humanity that such skill had wrought, I hinted that, with such remarkable facility for replacing lost teeth, and repairing diseased ones at our command, both patient and dentist were taking chances with the natural organs that they would never dare take if no mechanical substitutes were known. If our work of restoration were less successful, our efforts to prevent the loss of teeth would be more vigorous and emphatic.

I suggested that, in carrying on a warfare against dental caries, we must begin with the child at a very early age. In our own minds we must place the highest possible value upon the natural teeth, free ourselves from all thought of mechanical substitutes, and fight the battle as if the loss of a tooth were irreparable.

I spoke of Miller's theory as a practical working basis upon which to build up a system of treatment for carious teeth, and I drew attention to the theory of gelatin plaques as explaining some of the more obscure workings of Miller's theory. I showed that acid-producing bacteria, which we have come to accept as the destructive agents in the first stages of caries, do not receive their nutrition from the teeth themselves, but chiefly from particles of starchy and saccharine food found in the mouth.

I quoted the results of experiments which I had made to show that saliva varied as a culture medium, and I drew attention to the fact that bacteria would multiply much more rapidly in the thick, ropy saliva which we sometimes observe, than in the clear, watery fluid which we have come to look upon as the normal secretion of a healthy mouth.

I pointed out what I believed to be a marked association between this thick viscid saliva and rapidly progressing caries; but I regret to say that I was unable to state with any degree of certainty what caused the physiological change which gave rise to this condition of viscosity. I went on to state that so-called gelatin plaques were found more frequently and were more widely distributed in mouths containing this thick, mucus-laden saliva than in mouths in which the secretions were normal.

I stated that in producing decay artificially in the laboratory the greatest possible differences existed in the resisting power of the teeth used in such experiments. From this fact, as well as from the clinical experience of many careful observers, I was forced to conclude that living teeth differ materially in their susceptibility to and immunity from the action of caries. I also stated that caries was more easily produced by mixed cultures than by a pure culture or any of the lactic-acid-producing bacteria.

This, together with a tribute to Dr. D. D. Smith of Philadelphia, for the courageous enforcement of his convictions in the prophylactic treatment of teeth, was the substance of the paper of which this is a continuation.

I wish now to call attention to other causes which tend to further the deterioration and destruction of human teeth. I shall point out some of the evil consequences of this retrograde metamorphosis, and shall offer a few suggestions as to the best means of working our way up to a better condition of the organs of mastication.

Whatever theories we may invent to explain the causes of dental caries, one fact stands out clearly and cannot be controverted, namely, that caries is practically unknown among uncivilized races, and that degeneration of tooth-structure follows civilization like a Nemesis. Sometimes the changes which follow contact with civilization are so marked and so rapid that they seem almost like an epidemic. More frequently, however, the change is slow, working gradually, but insidiously and surely through long generations, until we wonder if this is, indeed, a process of evolution against which it is useless to strive. We must not forget, however, that evolution in the human race differs from that in the lower animals in this, that it is within the power of our intelligence to control it. Thought is supreme, and if we want good teeth, and want them badly enough, good teeth will be evolved to supply our needs and our desires. It is for us to say whether the human race shall become edentulous, or whether it is worth while to combat the degeneracy already begun and swing the huge pendulum the other way by eradicating disease and improving the structure of the human teeth.

This degeneracy is, as you well know, principally brought about by a loss of functional activity due largely to our civilized methods of preparing food. We resent with indignation food that necessi-

tates vigorous mastication, and we allow our children to wash down their meals with copious draughts of water. Nature resents such treatment, and refuses to supply the necessary pabulum for maintaining a neglected organ. To functional activity she responds at once. When an organ is vigorously used waste material is taken up and active nutrition takes the place of stagnation. You might just as well confine an arm in a plaster-of-Paris cast, and expect it to retain its strength, as to deprive the teeth of the exercise of mastication and expect them to continue strong and well.

It is probable that the intensity of our modern life—the fearful nerve and brain tension that we are almost constantly under—has much to do with the degeneracy of our teeth. We note clinically a marked effect on the structure of teeth following an illness involving the nervous system, and we are familiar with the transparent, blue, rapidly-decaying teeth of the highly wrought, intensely nervous child. This burning up of the vital forces by excessive nervous and mental strain must be accepted as a factor in accounting for the deterioration of our teeth.

It is not improbable that the immediate cause of caries, which we believe to be acid-producing bacteria, is more active to-day than formerly, because of the too bountiful supply of starchy and saccharine food which enters the mouth. This food serves as a medium for bacterial activity. It is pointed out by Röse, as a result of experiments carried on in Baden and Thuringia, that the amount of calcium taken in through the food and water supply must be recognized as a factor in explaining the liability of teeth to carious action. This is probably true also as applied to the prenatal development of teeth. Another important factor in bringing about caries is so well recognized that I must apologize for mentioning it. I refer to irregularities. Irregularities may be due to the narrowing of the modern jaw, to the mixing of racial types, to faulty eruption of the permanent teeth, to adenoid growths, thumb-sucking, mouth-breathing, or to other causes. Whatever throws a tooth out of line and produces a lack of symmetry in the beautiful curve of the dental arch makes it difficult to properly cleanse the teeth. Whatever produces a faulty articulation makes it well-nigh impossible to keep up proper functional activity. A tooth without an antagonist is bound to deteriorate.

Besides these causes there are others which may be looked upon

as accidental or at least as occasional, such as congenital imperfections, prolonged illness, pregnancy, chemical agents, and traumatism, but time will hardly permit of a consideration of these causes. There is, however, one other consideration that we must refer to in this connection. Dr. Michaels of Paris, in his work on Sialo-Semiology says, "The saliva of adolescence contains a dextrinic principle (glycogen) susceptible of fermentation under the influence of ptyalin in the presence of earthy salts. In this way is obtained the dissolution of the earthy salts by the substitution of lactic acid for carbonic acid." If this statement means anything, it means that lactic acid is formed in the mouth without the aid of bacteria, and that lactic acid so formed is capable of attacking the teeth and destroying them. Since reading Dr. Michaels' article I have sterilized and examined the saliva of a large number of children, and have in no instance been able to discover a trace of lactic acid that was not to be ascribed to acid-producing bacteria. While I have long believed that certain conditions of the saliva promoted carious action, I am equally sure that this is due to the fact that under certain conditions the saliva becomes a better culture medium and thus favors the increase of acid-producing bacteria. If it is true, as Dr. Michaels asserts, that lactic acid can be produced in the mouths of young people without the aid of bacteria, it is probably true also that the cases in which this change takes place are too infrequent to have any especial bearing on the subject we are now considering.

Having touched briefly upon the causes which assist in bringing about degeneration and loss of teeth, and before taking up the evil effects produced by diseases of these organs, let us pause a moment to consider how wide-spread the evil really is. Dr. Denison Pedley of England made some interesting studies of the teeth of school children in that country, and found that seventy-five per cent of the children examined had diseased teeth. This is a low estimate as compared with the condition on the continent of Europe and in this country. Statistics indicate that nearly ninety-seven per cent of all our public school children have carious teeth. It is not too much to say that thirty per cent of all the teeth of school children between the ages of five and fifteen in the public schools of this country are diseased. This is appalling when we know that only a small proportion of these children will ever receive treatment at the hands of a competent dentist; and when we realize that without such treat-

ment they must inevitably go from bad to worse, the situation becomes truly alarming. It is rendered more striking when we realize that in spite of unhygienic surroundings only two and a half per cent of the Eskimos have carious teeth; while the Indian and Malay tribes, having been smirched, but not yet conquered, by civilization, still dwell in comparative ignorance of caries, only ten per cent of their number being as yet afflicted.

It is not necessary to dwell on these facts to show what a menace to health and to mental and moral progress we have confronting us. Many of these unfortunate school children suffer with intermittent toothache for years; and thanking God for the intermissions, they bravely accept the condition as a part of their lives. What sort of mental and moral development can go on when burdened with such a handicap; and what an effort upon the child's health and physical development must such a condition bring about! I tell you that physical and moral degeneracy, idleness and crime may have a more intimate association with caries than we are willing to admit. To emphasize the necessity of a reformation in our care of the teeth, let us consider the relation of diseases of the dental organs to general diseases.

Three years ago Dr. Charles Stedman Bull, speaking before this society, pointed out the connection between diseases of the eye and dental lesions, in a paper so able that it attracted the attention of the medical profession throughout the country. Without now going into details, you may remember that he proved conclusively that keratitis, glaucoma, muscular paralysis, asthenopia, amblyopia without visible lesions, supraorbital neuralgia, and exophthalmos with and without cellulitis are frequently caused directly or indirectly by carious teeth. He showed that eye-complications of dental disease are of varied nature and may reach to the most superficial structures of the eye. He spoke most positively when he said that when we come to consider the lesions of the cornea and sclera, the cases reported in connection with diseased teeth are almost numberless. Cases of loss of accommodation from paralysis of the ciliary muscles have been shown to be in many instances due to diseased teeth, and optic neuritis ending in atrophy of the nerve and blindness has also been traced to carious teeth.

We are perfectly familiar with diseases of the nasal and accessory cavities which have their origin in dental lesions. We have too

often witnessed antral and aural disturbances dependent upon carious teeth not to fully appreciate the intimate relationship between these parts. It is a well-established fact that otalgia of a very pronounced type not infrequently arises from a carious tooth. Nervous interference with the nutrition of the middle ear may be due to dental disorders, and may cause impairment of hearing. In fact, when we consider the reflex disturbances due to diseases of the teeth we are at a loss for space to enumerate them.

When it comes to diseases of bacterial origin, we find that with few exceptions all bacteria find their way into the general system through the mouth. I have myself found the tubercle bacillus, the Klebs-Loeffler bacillus, actinomycosis, and many pyogenic forms in mouths of supposedly healthy people. A correspondent of *La Revue Médicale* reported 113 cases of lymphadenoma in children. In forty-one per cent dental caries was the only cause that could be found, and it is fair to infer that in a much larger percentage complications of caries were present. Chronic glandular swellings in the neck are dependent upon caries in a majority of instances. It has been found in several cases of tuberculous infection that the bacillus invaded the organism through a decayed tooth. Many cases are reported to show that primary tuberculosis of the mouth, which happily is not very common, generally shows itself first around a diseased tooth or root. General infections of septicemia followed by death are frequently reported, and in far too many cases these have their origin in a diseased tooth. Numerous cases of pyemia, periostitis, osteitis, and metastatic abscesses resulting in death have been shown to have originated in carious teeth. When we come to consider gastric troubles, the number proceeding from imperfect mastication caused by a neglected or diseased condition of the mouth and teeth far exceeds those from all other causes put together.

I could go on multiplying indefinitely those cases in which general disease is dependent upon dental lesions, but I have said enough to show that our professional work can no longer be confined to its present narrow limits, but that we must face broader and more important questions than now occupy our minds, if we are to make a permanent and useful impression upon the human race.

The question immediately arises, Is it worth while? We are doing our work in a comfortable way, showing more or less skill, and, it cannot be denied, doing more or less good; and we have a

comfortable income. Why excite ourselves about the rest of the world? Well, of course, if we are content to eat, drink, marry, and die, it is not worth while; but, thank God, that is not the kind of men the dental profession is composed of to any great extent! As I said in my first paper, it is one of the few professions in which men are striving to cut off the sources of their income by substituting prevention for cure. It is a profession that has had from its beginning the welfare of the patient at heart and has striven earnestly for the improvement of the human race. Scamps and charlatans belong to all trades and professions, but the proportion is comparatively small in the dental profession. The work is too hard and too exacting, and the dishonest and loose-fibered man can do better in some other walk of life. Therefore I feel that it is necessary only to show that this work of preventing caries is feasible, that it is important to the improvement of the human race, and that a fair degree or success awaits our efforts, to have every honest member of the profession do his part in bringing about the desired reformation.

When I make the assertion that the development of the dental organs and the strength of the same is and will always be in ratio to their use; when I say that lack of use will infallibly tend to weaken and to the suppression of these organs, I am simply stating a well-known scientific principle, and do not wish to be misunderstood. I do not know what the intention of the Almighty is in regard to the future of the human race, and I do not believe any one else knows. If we conscientiously believe that in the process of evolution the teeth are doomed; that it is fruitless to waste our time in combating the degeneracy that has already obtained so strong a foothold, it is our duty to help on the process by wholesale extraction, so that we may have at least clean gums and clean mouths and lessen thereby the danger of that general infection which I have shown to be associated with diseased teeth.

The thought is repulsive to you, but it is not illogical. As a matter of fact, strong teeth are associated with and are essential to the best types of manhood. If my statement seems startling I can show good grounds for making it. In the first place, it has been shown by the examination of the teeth of school children in England, on the continent of Europe, and in this country that there does exist a ratio between the physical soundness and mental acuteness of the child and the condition of his teeth. I am not willing to

pervert facts by saying that this ratio is very pronounced, but I firmly believe that it will be more emphatically shown when the investigations have been carried farther. The child with strong teeth will be found to have decidedly the best of it, both physically and mentally, and that he will be morally stronger will follow as a matter of course. As the age of the child advances the difference seems to be more marked, and when we reach the age when in this country boys enter college, the fact begins to be established in a remarkable degree.

I have had for patients a large number of college students, and my interest in college sports has brought me into intimate relations with the trainers, coaches, and captains of crews and teams. In this way I have had opportunity to examine the mouths of a large number of the members of "Varsity" crews and foot-ball teams, and of other college athletes. I have naturally been led to make inquiries of other dentists regarding this class of men, and have also gained a great deal of information from trainers and others interested in college athletics. I have not been able to classify and tabulate the results of my examinations, for in most cases such an examination would be hasty and casual—usually made in the dressing-room before or after an afternoon's practice—but the results are striking. The proportion of strong sets of teeth among these young men is greatly above the average, and can be seen in the most superficial examination. I cannot deny that great intellectuality is often seen in association with weak teeth, nor can it be denied that men of large physique frequently have poor teeth, but that combination of vital energy and mental strength which goes to make commanders and vigorous pioneers is rarely found in association with frail teeth. Our beloved Washington was one of the rare exceptions. If it is true, then, that deterioration of the dental organs will cause a general deterioration in the human race, our duty is plain, and we are bound to apply our energies to combating this great evil.

In my last paper I marked out a line of treatment which will, I am persuaded, prevent a large percentage of decay and will carry a child through life without a large filling or other serious operation. Without repeating, it is sufficient to say that the plan consists in frequent examinations and frequent polishing. Once or twice in our professional lives we meet with a conscientious mother who insists upon having her child's teeth taken care of. If there is a speck or

shadow on the infant teeth she comes and demands an appointment. She pesters us with questions as to the care of the child's teeth, and insists upon our making the most minute examinations and doing the most careful polishing. She makes life a burden to us by her insistence, and we are almost ashamed to make a charge for the slight and seemingly unnecessary operations which we perform. But what is the result? If a spot is discovered which marks the first step of caries, we polish and polish until it disappears, and no cavity results. The teeth strengthen, and we find that when the child grows up the teeth are strong and only a few small fillings have ever been inserted. We give ourselves small credit for this result, and in our blindness believe that the child's teeth were naturally strong and resistant to decay, when, as a matter of fact, our own efforts, called forth by one of those God-given mothers, have produced this wonderful result. Did you ever know any other result in such a case? Is it not almost inevitable that such a child will have excellent teeth? It is only necessary to apply this same treatment to all children to have uniformly strong and healthy teeth.

We ought to take the initiative, and not wait to be prodded into doing our duty. It is for us to educate the mother about the care of the mouth. We should point out the importance of proper mastication and show how suicidal it is to allow the little ones to wash down each mouthful with water. It is within our province to inquire into the feeding of the child and to make suggestions on this subject, and I can assure you that in most cases these suggestions will be received with gratitude and the attempt will be made to improve the faulty diet. I have very little faith in the practice of feeding special foods for a special purpose, because we know so little of the marvellous chemistry of digestion and assimilation that we cannot follow the food to its ulterior depository, and the phosphates that we feed to nourish the brain may, for aught we know, find their final resting-place in the joint of a big toe. We do know, however, that certain foods are insufficient to nourish certain organs; that finely bolted flour, for instance, will not build up tooth-structure, while whole wheat contains the nutrient ingredients.

With the knowledge we have of the means of prevention, with the readiness with which our views are accepted by our patients, there should be little or no trouble in reducing caries to a minimum in private practice. Three-fifths of the dental operations performed

in the last twenty years were preventable. Will it be possible to make that statement at the end of the next twenty years, or shall we have succeeded in reducing that proportion? I have not spoken of brushing the teeth nor of the use of washes, for I have nothing to say that you do not already understand. There is, however, another important aspect to this question which we must consider, and that is the condition of the teeth of the poorer classes.

Poor teeth cause poor digestion. Irritability of the stomach produces a craving for alcohol, and alcohol causes crime. Ergo, unhealthy teeth lead to unhealthy morals. This may sound like the Darwinian theorem which demonstrates that the old maids of England are the cause of her vigorous manhood. The bone and muscle of Englishmen are derived from the excellent quality of the English beef and mutton. These fine cattle and sheep feed chiefly upon clover. The clover is fecundated by bees that carry the pollen from one plant to the other. Field mice are the enemies of bees and destroy their nests. Cats are the enemies of field-mice and destroy them, and the old maids care for the cats and encourage their increase, and hence are the cause of the strength of the men. It is an interesting chain, but no such roundabout method of reasoning is needed to show that the proper conservation of the teeth is essential to health and happiness. So far as the well-to-do classes are concerned, I believe that the tide has already turned, and that the effect of prophylaxis is beginning to be felt, but the question of what we shall do for the teeth of the poor calls for our most thoughtful and prayerful consideration.

In the economy of human life the teeth are of no less importance than eyes, ears, throat, lungs, spine, or any other portion of our anatomy. But while for diseases of every other part of the body free hospitals and dispensaries offer to the poor every facility for treatment, there is not, to my knowledge, throughout the length and breadth of this land a single place where a person unable to pay a fee can have the tortures of an aching tooth assuaged by competent hands. I do not forget the excellent work done in our college dispensaries, but that, as you know, is so small in amount compared to the great need of such work that it only points out more emphatically the need of free dispensaries for the poor. While we are trying to influence legislation, and are bringing this matter to the favorable notice of State and city governments, there should be

little difficulty in getting a private endowment for one or two such institutions. There are ten or a dozen men before me to-night who could each raise fifty or a hundred thousand dollars among his own patients for such an object as this. These institutions, started perhaps by private means, would soon demonstrate that from economic motives their existence and usefulness should be maintained. The decrease of crime, the lessening of disease, the improvement in physical and mental conditions would be soon remarked, and these institutions would form an important part of our public education by teaching oral hygiene. That there would at first be opposition springing from the ignorance of the poor there is no doubt. They have an exaggerated dread of all dental operations. This would be soon overcome if the dispensaries were in the hands of wise and kindly men. Good teeth should be made a prerequisite for attendance in our public schools, just as vaccination is required at the present time. To bring about these changes we must gain the cooperation of medical men, and this we can do in a large measure through our personal acquaintance. We must influence the instructors in our dental schools so that this subject may hold a more prominent place in the college curriculum. Dental sanitation should occupy a large space in our books on hygiene and in our dental and medical literature, and, most important of all, our dental societies should become interested and take the initial step in starting this reformation. And that is what I am here for to-night. My convictions are from long and earnest study, and I have drawn no chimerical picture of the needs of our race; nor do I believe that if we give our hearts and hands to the work of improvement the undertaking will be beyond our strength.—*International, Feb , 1902.*

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NERVE REGENERATION. The healing of nerves is a subject of much scientific as well as actual practical interest. At the present time most investigators hold that when a peripheral nerve regenerates, either after division or degeneration, the peripheral segment undergoes "neurotization" from the end of the proximal portion. This means that the ends of the axons above the point of division or degeneration grow out into the distal part of the nerve, the continuity of which is thereby restored. Clinical surgery teaches that this process may require weeks and months for its completion. But there is another view, at the present time held by a small number

only, which teaches that in nerve regeneration axons, medullary sheaths, and neurilemmata are formed from cells in the distal segment, called neuroblasts, and that the fusion of the different parts thus produced with one another and with the central part restores the continuity of the nerve trunk. This theory, which may be called the peripheral theory, is not in harmony with our present conception of neurons, each of which is regarded as a complete cellular unit capable of regenerating its lost parts, at least within certain limits.

The most recent investigation in nerve regeneration is by the two Englishmen, Charles A. Ballance and Purves Stewart, whose numerous experiments gave results that in their view are reconcilable only with the peripheral theory of regeneration. Ballance and Stewart find that when a nerve trunk is divided the axons and myelin sheaths soon suffer a fragmentary disintegration followed by absorption, which eventually extends throughout the entire nerve distal to the point of division, while in the proximal end there is only limited degeneration, the cut fibers curving back and forming a more or less distinct bulb-like swelling. The subsequent regenerative changes take place in about the same manner whether or not the cut ends are united by suture or other means. The cells of the neurilemma take on active neuroblastic function and produce short lengths of axons and myelin sheaths, which, linking themselves together, form continuous nerve fibers. At first the new sheaths are beaded, due it is thought to the presence at more or less regular intervals of cells which produce the myelin. Finally, the cells become less conspicuous and are recognizable at the internodal points only. In the scar tissue that always forms between the ends of a divided nerve, the new sheaths increase in number from above downward and not from below upward as would be the case did the new sheaths represent downgrowths of the old. In transplantation experiments the engrafted nerve acts as a scaffolding for the invading neuroblasts which enter chiefly by the side of new blood-vessels. As regards the axons, our authors state that from the appearances obtained by various methods "it is clear that regeneration of axis cylinders does not take place by a process of outgrowth from the proximal segment, but is commenced and completed by the activity of cells already existing in the trunk of the nerve." As stated, the junction of the proximal and distal segments of a divided nerve is not

essential for the regeneration of axons in the distal part, but the axons that form under such conditions do not attain maturity. As the proliferating neurilemma sheaths finish their activity as producers of myelin and axons they arrange themselves in columns and coalesce into new neurilemmata enclosing the newly-formed myelin, which in turn is wrapped around a new axon.

Such in brevity is the manner in which nerves heal, according to the English investigators. They regard the peripheral nervous system as composed of chains of neuroblasts fused to form neurilemmata, myelin sheaths, and axons. The limited degree of regeneration of axons in the central nervous system, as seen, for example, in hemisection of the cord, they would explain as dependent upon the absence here of neurilemmata, which are of fundamental import in regeneration of axons and myelin sheaths. The neuron theory must be abandoned, because it is not in harmony with the facts observed by them in the healing of peripheral nerves. In the literature are several examples of early return of sensation after secondary suture of divided nerves. Jessop, Langenbeck and MacCormac have recorded cases of secondary nerve suture in which sensation returned on the eighth day, the seventh day, and the same day after the operation, and other cases of like nature might be cited. Ballance and Stewart point out that this early return of sensation after secondary suture is easily explained on the score of "peripheral regeneration" of nerves, the secondary suture restoring the conductivity of the otherwise quite fully regenerated parts. But there are many conflicting statements in the literature in regard to the early return of sensation after secondary suture, and it is noteworthy that there is no early return of motion under similar conditions; for this reason much weight can not be attached to the significance of the early return of sensation after secondary suture in its bearing upon the mode of regeneration.

Without attempting minute criticism of the work of Ballance and Stewart, it may be permissible to point out the general fact that the peripheral degeneration distal to the point of division of a nerve does not harmonize well with the theory that regeneration is accomplished by the neurilemma cells taking on neuroblastic functions. If these cells have the power to form pieces of axons and medullary sheaths, at first discontinuous, it becomes rather puzzling to attempt to discover any good explanation for the degeneration that follows

division. It rather would seem that the peripheral end, if of peripheral origin, might maintain its vitality at least for a time, even though its connection with the central neurocytes is severed. Degeneration after nerve division is easily understood when we regard the neuron as a functional, nutritive and anatomic unit. Further investigations are necessary before the neuron concept now in vogue is materially modified.—*Edit. in Jour. A. M. A., March, 1902.*

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MOISTURE AND WEAK TOOTH STRUCTURE. By Dr. F. F. Hawkins, Troy, N. Y. Read before the Third District Dental Society of New York, Oct. 15, 1901. I wish to state a proposition: Just in proportion to the moisture within a tooth is its structure weak and vulnerable. Moisture is defined as: "that which makes damp," "liquid in small quantity"—and it is the presence or absence of this moisture within a tooth that often counts for or against success in dental work.

The teeth never remain in a static condition. They are either progressing healthfully toward their highest efficiency or they are retrograding. They never stand still as regards the proportion of their constituent elements. The enamel and its fibres, the dentin and its canals of myxomatous tissue, the cementum and its lacunæ of protoplasm, all are ever changing.

The heart in its labor is forcing with each beat to the extremest peripheral point the fluids of the circulation—carrying, if the person is in perfect health, the tooth-forming material necessary for perfect construction, and laying the foundation for the greatest resistance against attack. If, however, the person is in ill health and remains below par for any great length of time, the heart's action fails to build the part, and the tearing-down process begins and continues until dissolution is accomplished. Why is this? It is because the function of nutrition has been disturbed. The food, the drink, or the air taken in by the person has been insufficient or impure. The tooth material has not been supplied to the blood corpuscles, and when the circulating fluid ramifies the tooth structure it is not the good and faithful servant it was during health, to deposit the minute particles of lime salts, and renew the tired medullary tissues so that they can continue their work and vigils joyously—they cry out for help which does not come, until weakened by neglect, the parts, like the soldiers of a deserting general,

begin to retreat with each ebb of the heart's tide until all that would have so gallantly withstood the attacks from without, had they been reinforced, have fled, leaving little but moisture for defense—and when our little explorer passes through the softened enamel and the patient cries out, we know the past history of the case, and see our trouble ahead.

Bödecker's Views.—Bödecker says, "Enamel was for a long time considered to be a deposit of purified lime salts, a coat of mail destitute of life, but researches have demonstrated the presence of living matter *between* and *within* the enamel prisms, and consequently affirm that enamel is a tissue with properties of life." He says, "Nothing, however, was known as to the seat of life in dentin until I and others endeavored to prove not only that dentinal fibres and their coarse offshoots are formations of living matter, but that the basis substance, so rich in lime salts, is traversed by an extremely delicate filagree of living matter as well. With the facts before us we may attempt to approach the solution of a hitherto insoluble riddle—the nutrition of the dentin and enamel. No close observer will doubt that the nutrition of the teeth is and must be an active one. This is proven not only by the growth of these tissues, but also by the same tissue's strikingly rapid loss of lime salts in constitutional diseases, such as neurasthenia, anemia and even pregnancy. How are the lime salts deposited in the dentin, and how can they be removed to such a degree that dentin originally hard becomes in a few months soft and resistless? Looking at the dentinal canaliculi with the highest powers of the microscope we see between the dentinal fibre and the walls of the canaliculus a narrow, light space, evidently filled with liquid, which serves for the carrying of nourishing material to the dentin and for carrying of effete material away from it. We are prepared to acknowledge the possibility that in living dentin the living matter proper is at no time perfectly at rest; that on the contrary it is contracting slowly but continuously, and through its contractions it not only stirs the surrounding columns of liquid, but pumps, as it were, nourishing material *into* the minutest fields of the dentin or away from them.

"The mechanical character of the liquid may explain the dissolution of a certain amount of the lime salts deposited in the blocklets of the basis substance, which salts, thus being rendered effete, may be carried into the lymphatics of the pulp, and thence into the lymph system of the body for further elimination. Why in one instance nourishing material should be carried from the blood-vessels of the pulp *into* the dentin, and in another instance carried *away* from the dentin into the lymphatics, we are unable to understand.

"What I have stated concerning the tissue of dentin unquestionably holds good for the tissue of enamel also, and every dentist must

have observed instances of softening of the enamel as the result of constitutional ailments. Recalcification—rehardening of the enamel, is certainly a fact. The structure of the enamel fibres, between the prisms as well as those traversing the latter, points to the identity of the process of nutrition, and denutrition, with that of the dentin."

The dentin and enamel receive their nourishment through the blood-vessels of the pulp, while the cementum, which is an ever-growing portion of the tooth—thickening as age advances, and deriving its supply from the pericementum, is liable to mutations through good or ill health. Dr. Black seems to have given the dental profession the impression that all teeth are the same—that is, that there are no soft teeth, and no hard teeth, but just teeth.

Taft's Views. Dr. Taft in recent remarks on this point says, "Every practicing dentist recognizes the difference between the structure of one tooth and another; some cut easily with chisel and bur, while with others it is almost impossible to break down. Now, this is not so much a difference in the structure of the teeth, so far as the constituents of the teeth are concerned, but a difference in the relation of the enamel rods one to another. If these two teeth are analyzed chemically you will find as large a percentage of lime salts in the one as in the other. This difference is due simply to the arrangement of the enamel prisms, and not the chemical difference in structure. In some cases the prisms run more regularly, and radiate straight out upon the dentin, one beside the other, and the cement substance which holds these prisms together is easily broken down. In other cases these prisms are wavy, irregular and hold firmly together, and it would be necessary to break across a prism in order to fracture the structure. But the truth is, that the teeth which are so resistant to our instruments may be just as readily attacked and broken down by the cause of caries as would be a poorly constructed tooth. The point I wish to make is this, it is more a question of environment, the conditions surrounding the teeth, than tooth structure itself which makes the difference in susceptibility to decay."

The Author's Views. Now, here is Dr. Taft trying to explain Dr. Black, and he has misled us decidedly. For when he says, "Teeth which are so resistant to our instruments may be just as readily attacked and broken down by the cause of caries as would be a poorly constructed tooth," and when he further says—"the point I wish to make is that environment and not tooth structure has more to do with susceptibility to decay"—he tells us something which we have a pardonable right to doubt when we consider how the tooth is nourished, and how it is *denourished*. If we consider

a single tooth in the mouth of a perfectly healthy person, one who has been perfectly nourished from birth, we follow in our minds the building of that tooth as the blood-vessels come freighted with the proper tooth pabulum, with the vital force within the tooth busily functioning to construct enduringly, packing the lime salts so carefully that attacks from without will find no vulnerable point—shaping the little canals for the future highways through which to bear the nutrient material to build and build till life ends. This is the history of health, and the tooth constructed under its supervision will withstand all the accidental environments which may overtake it. But, again, let us follow the building of a tooth in the mouth of a person who through life has been in ill health, and fought every day to live. We find the vital force in this tooth tired and weary—the blood supply which comes to it is always deficient in lime salts, always defiant in protoplasmic elements, so that, work as hard and faithfully as it can the vital force constructs but a poor home for its future occupancy, its walls are porous, and its rooms are large and full of moisture. This tooth is vulnerable at any point or *en masse*. This is the difference between good and poor tooth structure, and it must play an important part in our work. In severe and exhausting sickness the poor tooth goes to pieces quickly because its poor structure makes it liable to attack from within, even the material which has been so begrudgingly brought to it is taken away, the parts are broken down and withdrawn for use in other parts, the vital force is so weakened that it permits the invader to enter and take out the basis substance and give in return just a circulating fluid. This is the time when tooth environment may be spoken of as an agency of decay. The environment is there for the same reason that the tooth is deficient in lime salts. When the organs of the body fail to function normally—from whatever cause—then is the time when the weak tooth suffers from within and from environment also. The causes which rob the internal structure of the tooth of its resistance are the same causes which pour vitiating secretions over it, and blow corroding gases from the stomach and poisonous exhalations from the lungs on it.

The tooth of the ten-year-old, and the same tooth at fifty is strong in proportion to the absence of moisture. Take, for experiment, a plaster tooth that is thoroughly dry—dried perhaps for years—and you will find it is hard to cut or carve. Now dip this same tooth in

water and note the change in its crushing resistance. There is no more or no less lime in this plaster tooth than before, but the moisture has lessened the cohesion of its mass. Again, take this same dry plaster tooth and place a soft pellet of cotton dipped in C. P. sulphuric acid against it on one side, and you will notice very little change. Now, from the opposite side with a dropper, thoroughly saturate the tooth with water, and as it approaches the acid you will see the plaster tooth gradually disorganize at that point. I speak of this to emphasize the fact that weak, moist tooth structure is quite necessary to bring out the full potency of environment, and this brings me around to my initial assertion—that just in proportion to the moisture within a tooth, is its structure weak and vulnerable.—*Items, Feb., 1902.*

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SHALL YOUNG CHILDREN BE GIVEN MEAT. An interesting article on the feeding of growing children after the nursing period appears in the *Medical Record* for January 15, from the pen of Dr. J. E. Winters of New York. Sketched briefly his ideas are as follows: From the seventh to the tenth months the ferments which digest farinaceous foods are secreted in sufficient quantity, so cereals should be given. The author prefers oatmeal, since it is rich in fat, proteid and mineral matter, and especially in iron, in which milk is deficient. To remove the cellulose it is cooked and strained and a tablespoonful of the jelly added to every second bottle of milk, this amount being gradually increased. During the summer months barley gruel is preferred.

When the child is a year old eggs are given, at first in very small quantity, then increased. They are very rich in proteid, fat and mineral matter; the nuclein of the yolk contains salts of lime, phosphoric acid and iron in an easily absorbable form. During this period dry crusts of bread are given, at first twice a day. Eating of it develops the masticatory organs, and it is one of the most useful foods. Cereals should be given without sugar, which has a strong affinity for water, which it abstracts from the mucous membranes, causing indigestion. Fruits (orange juice and prune pulp) are useful at this stage.

As the child grows older and enters upon a stage of rapid development the author points out certain principles of treatment. He shows that it needs a considerable quantity of proteids for body

growth, much more of the mineral salts for the bony framework of the body than the adult, carbohydrates in large quantity for heat and energy production, and especially to spare the permanent tissues and fats for similar purposes and also because of the relatively large proportion of fats found in brain, nerves and bone-marrow. A child of five requires half as much fat as a man doing moderate work.

Coming to the question of flesh food, beef contains four or five times as much nitrogenous matter as milk, but comparatively little of this is in the form of proteids and available for food; extractives make up 15 per cent of the nitrogenous part of meat, and they are not only valueless for food purposes but may be positively injurious to young children.

Continuing, the author says: "The excess of proteids and extractives contained in flesh foods acts as a stimulus to some reflex nervous machinery through which metabolism of all tissues is hurried on. In a child combustion is relatively greater than in an adult for two reasons—first, the smaller organism having the relatively larger surface carries on a more rapid metabolism per unit of body weight; second, the metabolism of the growing parts of the body is from $2\frac{1}{2}$ to 6.3-10 greater than that of the parts already formed.

"The proteids and extractives from flesh foods stimulate the normally active metabolism of a child, and prevent storing of the tissue-builders. Overstimulation of metabolism by an excess of animal food interferes with laying on flesh—fat or muscular flesh. Carbohydrates are easily oxidized, and their oxidation serves to protect the proteids and fats from consumption. The shielding from oxidation of these requisites for the growth and development of new structures is a matter of profound value and consequence to a growing child. Carbohydrates and fats by their sparing action increase the store of proteids. A child increasing its capital of flesh tissue should have proteid-sparing food in abundance, and food which stimulates metabolism should be given in such quantity only as is necessary for the actual requirements of the system's daily needs.

"The brain appears to require nitrogen, which can be obtained only in a concentrated form from animal sources. Highly nitrogenized food is a nervous food, valuable where bodily energy and intellectual capacity must be assured without taxing the digestive organs.

"Muscles do their work upon carbohydrates; a child, with its

unceasing, acrobatic, muscular feats, should have an abundance of that food which is regarded as the most valuable source of muscle-energy, and the sensitive, nervous system should not be stimulated by a nervous food.

"One of the most unfortunate, wholly unconsidered, evil consequences of an early and liberal meat diet is the disrelish it creates for the physiological foods of childhood—cereals, vegetables, milk. A child that is allowed a generous meat diet is certain to refuse cereals and vegetables. Meat, by its stimulating effect, produces a habit as surely as does alcohol, tea or coffee, and a distaste for less satisfying foods. The foods which the meat-eating child eschews contain in large proportions certain mineral constituents which are essential to bodily nutrition and health, and without which the processes of fresh growth and development are stunted. This brings us to the kernel of our subject.

"The chemical processes in the organism are dependent upon alkaline-reacting tissue-fluids. In the combustion of flesh foods (proteids) in the organism sulphuric acid is formed, and death may be caused by a lack of alkaline bases necessary to neutralize this acid product. The function of every individual cell, the nutrition of every tissue, the perfect consummation of every chemical process in the organism are dependent upon alkaline-reacting tissue-fluids, which alkaline reaction is due to alkali-carbonates.

"These alkaline bases are also of great importance as constituents of certain secretions, such as the saliva, the pancreatic and intestinal secretions, and for the transportation of carbonic acid in the blood, that it may be removed from the system.

"For the processes of fresh growth, for the construction of bone, muscle, etc., mineral constituents are likewise required in large proportions.

"For the supply of alkali-carbonates for the tissue-fluids; for the alkalinity of the blood and the numerous secretions which are poured forth in almost incalculable quantities during every twenty-four hours; for the transportation and elimination of carbonic acid from the system; to neutralize the sulphuric acid formed in the combustion of the proteids; for the passage of the proteids from a soluble to a coagulable state, and for the organization of the proteids; for the supply of the large amount of minerals needed for the growth of the bony framework, and for the muscles of the growing

child, alkaline bases must be introduced into the system in large amount. The nutritive value of food substances is generally estimated by their proportions of proteids, fats, and carbohydrates. In a child the mineral constituents are equally important with any of these.

"These mineral constituents cannot be introduced into the system in an assimilable form except in organic combination with an albuminous molecule, and are found only in organic combination in sufficient proportions to meet the large demands in a child in certain vegetables and cereals which obtain them direct from the soil as provided by nature.

"The evil fruit, the pathological consequence of this unphysiological and abnormal feeding, is to overstimulate the delicate nervous organization, with undeveloped controlling centers and almost completely developed sympathetic nerves; to tax the system with incompletely burned, merely charred, excretory products; to render the urine, which in the young child is normally highly acid, abnormally so; and in its train, incontinence of urine, rheumatism, chorea, rheumatic tonsillitis and torticollis, night terrors, urticaria, angioneurotic edema, and finally, from poisonous excrementitious products, anemia, acute convulsions and petit mal.

"Physiology and physiological chemistry make it unquestionably clear that meat should not be given in early childhood. Experience demonstrates and proves the accuracy and the value of physiological teaching. The ever-active, muscle-laboring, growing child, with its rapid heat loss, should have an abundance of cereals, vegetables and milk in its diet to meet physiological requirements.

"Children in whose diet meat is a large factor have not the robustness and vigor, the freedom from attacks of ill-health, witnessed in those who have meat but sparingly. A disproportion of animal food in the diet of a child, by overstimulation of metabolism, leads to imperfect tissue-nutrition, delicacy of constitution, and irritability and peevishness of disposition; the resisting powers of the organism are impaired; the susceptibility to disease heightened. Meat juice should not be given to a healthy child under two years old, and then in quantities not to exceed half an ounce to one ounce three times a week. The healthiest children are those who have meat only every second day up to the age of five and six years.

"Suitable adaptation of the different food constituents to cover

the large demand for heat and energy, and for the storing of proteids, minerals, and fat for future needs, is the paramount consideration in the diet of a child."

* * *

ULCERATION FROM CARIOUS TOOTH. By Dr. H. H. Grant, Louisville. I have seen within the last week a case which is of interest in one particular at least. A young woman, aged 21, for over two years had had more or less irritation on the left side of her face just below the angle of the jaw, and about a year ago the last molar erupted just at that point, and there was an ulceration completely surrounding it. Nothing was done for it and the tooth was not extracted. She was sent to me as a clinical patient, and was seen by a number of dentists, who were much interested in the case, as it seemed to be a rather unusual condition. I incised the tissues around the tooth, and found that not only the tooth but the alveolar border of the superior maxillary bone had turned outward with it, and the tooth was really seated in the same way as it would have been in the normal position in the jaw, surrounded by the alveolus. The tooth was extracted, the alveolar walls chiseled off, and the wound closed by interrupted sutures of silkworm gut and completely closed, except at the lower border. It has now healed, except at the point where I put in a drainage tube. The patient is now seemingly well, but the swelling which was present, and had been present for nearly a year, has not yet entirely disappeared. There was a distinct infiltration of inflammatory exudate, and there is considerable difference between the two cheeks at the present time. Whether this will all disappear or not, I am unable to say.

The unusual feature about the case is that the alveolus and tooth turned outward, so that the tooth with its cutting edge appeared directly through the skin, and had remained in that position as a foreign body for over a year. I have once before seen a troublesome ulceration of this kind in the gum, the tooth being extracted through the mucous membrane, but I have never before seen a complete turning out of the alveolus where there was no trouble with the mucous membrane. In the case just reported the tooth had gone completely through the skin and appeared externally. It will leave more or less scar on the cheek, and it is rather astonishing that a patient of this age should have gone on without any treatment for this length of time when the condition could have been cured with little trouble two years ago. It was a surprise to all the dentists who saw the case that there was no ulceration of the mucous membrane.—*Louisville Jour. of Med. and Surg.*, May, 1902.

Letters.

DOCK MEASLEY GIVES THE BOSS SOME POINTERS.

(AS TOLD BY THE OFFICE BOY.)

One morning Dock Measley, what ain't been practicin' only Two Years, he come into our Offis to Vulcanize a Plate. He was there more than two hours, an' I seen he was Takin' Notes o' some things the Boss done durin' that Time. There was one lady that had had some Tartar cleaned off her front teeth, an' the Boss never charged her nothin', 'cause it only took a Minute. So I reckon she thought then she'd order be agreeable some way to make up, so she begun to talk about Tooth Powders. Says she, "What do you think is the best powder, Dock Contour? I've always used Precipitated Chalk an' Orris Root, an' I reckon they ain't nothin' better, is they?" Then the Boss he explained that them two things was ingredients o' most all Tooth Powders, an' other things was required in a Powder, an' he said they was several good preparations fer Teeth. Juneberry & Brown's paste, So's-you-don't, an' lots of others. He was about Half a Hour tellin' her, an' she said she had learned a Lot, an' she was a-goin' to tell all her Friends. An' then, after she'd Ast him Was Dock Peabody a Good Dentist, an' was Candy good for Children's teeth, an' had you Order use a Stiff tooth-brush, she went away. Then Dock Measley he Opened Up. Says he, "Do you know how long you were talkin' to that Woman? Forty minutes by the watch. Do you know how mutch Good you Done her, a-tellin' her all that? Jis' none at all. Not a Blamed Bit. You Watch Out an' you'll see that Woman a-comin' in your Offis in three or four Months, an' she'll say, 'Dock Contour, I always use Prepared Chalk an' Orris Root as a Dentifrice. I don't reckon they's anything better, is there?' showin' she ain't minded a word you've said. Then you'll have to Pump another Dental College lecture three-quarters of an Hour long into her."

The Boss he looked Offul Supprised. "Why that's exactly what she did say, when she was in here about two months ago. An' you heered her say it agin, jis' now. An' I told her all I've jis' been a-tellin' her, that other time." "Exactly so," said Dock Measley. "Now you listen to me: you don't never want to stand talkin' to Patients about triflin' matters o' that Kind. You'd order make

them think you're too busy. That's the Very Way to demoralize your Business. You see that Woman she's Unconsciously got the Impression now that your Time ain't of no great Value, an' the first time she makes an engagement she's liable to break it without sending you any Word. Listen here, to how I do. When a Woman asts me that question about Tooth Powders, I turn to my young lady Offis Girl, an' I say, 'Susie, fetch me a bottle of our Unrivalled Tooth Powder?' I don't say nothin' about no other Kinds, an' I don't tell her whether Orris Root an' Precipitated Chalk is any good or not. I say, 'This is what your teeth Require. Fifty Cents, please.' An' I look Firm an' Composed, an' she don't never say 'charge it in the bill,' but she pulls out her Purse an' pays right away. Of course she never comes back for some more tooth powder, but she never Bores me again about Orris Root an' Precipitated Chalk, either."

Dock Measley smiled, like it was a Good Joke. Says he, "Some Dentists thinks it ain't Perfessional to sell Tooth Powder. But you note this down; things that is unperfessional from one point o' View ain't necessarily so from the Patient's point of View. The Reel Point is to make the patient Pay fer everything he gets from you. They ain't anything more Important than that. It's the havin' to Pay that makes them rate you above a Dry-Goods clerk. Patients don't care a Dern whether us Dentists is Perfessional Men or not. The reel p'int is to make them Respect you, an' 'not to let them fool your time away.'"

I could see the Boss he jis' didn't know how to Express his admiration. Dock Measley, he Went On—"Make 'em Pay for everything, I repeat. If you've got to Stand Round Haf an hour tellin' why a tooth aches after the nerve is dead, charge three Dolars. Puttin' Silver Nitrate on a Tooth orter be a Doler at least. Tellin' how it acts orter be another Doler. Lookin' in your Ledger an' findin' it ain't your Filling that's Come Out orter be Three Dolars. Blame it all, it's the Money Value of the Service performed that makes a man Perfessional, Dock Contour. They ain't no Reel Reason why Dentists should rank below Merchant Tailors an' Dress Makers."

Dock Measley he seemed Offul stirred up. "There's another thing I noticed," says he to the Boss, "that Lady she said to you, 'there ain't only one or two old fillings left in my Front Teeth; the

rest you've put in, Dock Contour.' Now then; is that true?" The Boss spoke up real quick. "No it ain't. She's got seven fillings in her Front Teeth that was done by some Quack Dentist. I never done but one Filling in her Front Teeth, an' my books will show it. "I thought so," said Dock Measley. The Boss looked Surprised again. "I say I thought so, 'cause I know people always think the last dentist that's done anything for 'em is responsible for everything they ever had done to their teeth. It's always his Fillin' that's Come Out, no matter if Fourteen Other dentists has done work for them."

The Boss he looked consumed with admiration. "I don't see how you, a young man that's only been practicin' a Little While, have managed to Ketch On to so many Fundamental Truths about Patients," said he. "Derned if what you say ain't Every Bit true!" "Of course it is," said Dock Measley." "Now what you'd order done when that woman said that about all them Front Fillings bein' yours, was to Fetch Out your Ledger right away, an' show her she was Mistaken. An' you'd order made a Marginal Note like this— 'Mis' Brown claimed all the fillings in her Front Teeth had been done by me, an' I showed her she was Mistaken. An' you'd Order of showed her that Note. Then you wouldn't of had the Bother in store for you now."

"I don't reckon they's any trouble ahead fer me. What do you mean?" said the Boss. "Why, jis' this," said Dock Measley. "I kin see that Woman a-comin' in here about six months from now, an' she'll say, 'Dock Contour, one o' them fillings you put in my Front Teeth some time ago, has come loose. How do you reckon that happened?' Then you'll say right away, 'I never put only one filling in your Front Teeth; all the rest was done by some other dentist, before you came to me.' Then the Lady she'll say, 'Oh, you're certainly mistaken, Dock, you admitted the last time I was here that you'd done all my front fillings over for me.' Then she'll claim that it wasn't done good, an' you'd oughtn't to charge her for doin' it over, an' it'll end in a Row, an' she'll go to some other Dentist, me, likely as not."

Dock Contour he listened reel Respectful to all Dock Measley was a-sayin'. Some Dentists would of been Riled at the Idee of a Young Dentist like Dock Measley tellin' them how to do, but the Boss he ain't got a Speck o' Envy or Jealousy in him, an' he was quite

willin' to learn from Dock Measley, fer he said to me later, he recognized the instink of Genius in him. "He ain't been in the Perfession but Two Years, James, but he shows an uncommon Aptitude for the Business Features o' Dental Practice. I wisht I had his Genius, I do indeed. I'd of been better off, if I'd of had him to Coach me years ago.,'

Well, after awhile it come Lunch Time, an' Dock Measley suggested that they go to a restaurant, an' so I went along with him an' the Boss, havin' a Bill to Collect for the Boss. So as we was a-goin' along the Street, in a Busy Part of the City, a man he bowed to Dock Measley, an' then he motioned towards him with a kind o' Commandin' Gesture, like he'd of Said, "Come 'Ere," So Dock Measley an' the rest of us Stopped, an' the man said, openin' his Mouth, an' throwin' his Head Back, so as Dock Measley could See, says he, "Lookey Here." Then he pointed to his Mouth, an' Dock Measley he Looked, an' the Man said, "It's that Tooth you Filled fer me, las' Week. It's sensitive to Heat an' Cold. What's the matter with your Work?"

So Dock Measley says he, "Sit down here on this Dry-Goods Box an' I'll see." The man he seemed to think it was a Trifle Conspicuous, but he Set Down, an' then Dock Measley he Got Out a big Jumbo mouth mirror, an' he Pried the Man's mouth open about a Foot, an' Busted a Fever Blister, an' the man Yelled, an' says he, 'Never mind, it ain't o' no Consequence.' But Dock Measley said he, "It's of a Good Deal of Consequence; open your mouth, Wide." So the man he Opened his Mouth the best he Could, an' a Crowd was Commencin' to Gather, an' Dock Measley he was gittin' More an' More interested, an' direc'ly he turned to me, like I wasn't only a Stranger, an' says he, "Boy, you go in that Saloon an' ast them to give you a Piece o' Ice." Then he Handed me Five Cents, to pay for the Ice. So I brung it, an' then he rubbed it over the Man's Teeth an' he Ast the Man if it Hurt. An' he said it Didn't, so Offul Mutch. By this time a Big Crowd had collected, an' the Man was showin' Symptoms of bein' Oneasy, 'cause everybody was a-lookin' down his Throat. But Dock Measley he didn't seem to be Satisfied yet, fer he Pried the Man Open again, an' he tapped on his Teeth with a Big Key, an' he prodded round with a Lead-Pencil, an' finally he ast if anyone in the Crowd had such a thing as a Squirt-Gun about their Persons. Nobody didn't seem to have

one, so Dock Measley says he, to the Man, "I can't do you or myself justice here. You'll haf to come to my Offis. I ain't got no Conveniences here. Come any time after Nex' Week. I'm Offul Busy jis' at Present."

Then the Man he looked like he wanted to Scalp Dock Measley, an' says he, "You've made a Mighty Nice Spectacle o' me, ain't you!" An' Dock Measley says he, "I'm Offul Sorry, especially as I've got to charge yon Three Dolers fer this consultation, it bein' out o' Offis Hours." The man he was so Indignant at Dock Measley, that he didn't pay no Attention to what he said about the Pay. But Dock Measley he kep' a-lookin' Turrible Hard at the man's Hip-Pocket, so directly he pulled out his Pocketbook an' he Paid Over the Money. An' says he, "This is the las' Dentistry ever you'll do fer any of Our Family, you chalk that Down! Makin' a Reg'lar Show of me, on the Public Street!" Then Dock Measley says he, "I don't see no Disgrace about relievin' Sufferin' on the Public Street. Who begun this, anyhow? Now you'd better Move On; you're liable to be Arrested fer Drawin' sech a Crowd."

Then Dock Measley he winked Sidewise at the Boss, but he never Smiled ner Nothin', no more than a Parrot does when you say, Polly want a Cracker! It was jis' like somebody had pulled a String somewhere inside him, an' he'd Went Off. After he was a Little Way off, said the Boss, "Ain't you afeard you've lost a Patient, Dock?" An' says Dock Measley, "I don't know, An' I don't care. I'll give you that man's address, an' you kin send him your Card, ef you Want to.

FRANK W. SAGE, D.D.S.

Cincinnati, O.

SEPTIC POISONING AND ACCIDENT INSURANCE —Kemper gives his experience with accident insurance companies as regards this disability and goes over the policies of different companies in regard to this point. He thinks the following propositions may be declared: 1. The surgeon who is insured and receives a disabling wound unfitting him for practicing his profession, is entitled to an indemnity whether he contracts septic poisoning or not. 2. A surgeon, while operating, may become infected through an old injury or a new wound. The effects are the same in either instance. There is no valid reason why a policy should not indemnify alike in both cases. 3. If a surgeon can not recover indemnity from an infection received through a sore, or an abrasion, then he gains nothing from a clause or rider attached to his general policy. In other words, the term "septic poisoning" in an accident policy is simply an aid to secure policyholders!—*Phila. Med. Jour.*

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Editorial.

THE STOCKHOLM MEETING AND ITS POSSIBILITIES.

The dentist who has kept track of the history of the profession for the last fifty years finds cause for infinite amazement at the rate of progress, especially during certain intervals. Although some forms of dental work date back to the earliest ages, the history of its organization as a profession, and the methodizing of its practice into a regular system, have all been done within the past sixty years.

The first step in the organization of systematic methods of procedure was taken when the first dental college was organized in America in 1839. So little was embodied in what might be called dental professional work at the time that the whole curriculum could be covered in four or five months. So extraordinary has been the progress since that three terms of seven or eight months each are insufficient to cover the course of instruction in our modern colleges. One can but marvel at what would have been the result had the University of Maryland acceded to Chapin A. Harris' request to appoint on its faculty teachers of dentistry and to incorporate dental procedure as a part of its teachings. He was refused, and that forced the formation of separate dental colleges, with a distinct degree, because medicine refused its own degree to those who had completed only a course of dental study.

If the University of Maryland had accepted Harris' proposition, it is not improbable that dentistry to-day would be what ophthalmology and optics are in their relation to medicine. Dentists under those circumstances would have graduated as medical men first and then added the dental teaching. At the present time ophthalmology is taught as a portion of medicine, and its practitioners hold the "M.D." degree as the qualification, but there is a limited mechanical field in the practice of that specialty, which is filled by the optician, who is not at all a professional man and who holds no degree. The

ophthalmologist writes his prescription for artificial lenses or glasses and the optician fills it.

This is essentially the position occupied by dentistry in Europe. The Zahnarzt in Germany is a medical man who, theoretically at least, practices nothing except the medical branches. If there is mechanical work to be done he employs or directs the employment of a Zahntechnicker, who does mechanical work for the Zahnarzt, as the optician does it in this country for the ophthalmologist. It is true that the Zahnarzt fills teeth, which is mechanical, but this has been adopted as a part of surgical practice, and the filling of teeth is considered a portion of surgical procedure, and as such is practiced by the Zahnarzt.

Dentistry, however, includes much more of mechanics than does ophthalmology, and prosthetic dentistry is considerably more an integral part of dentistry than is the fitting of artificial lenses a part of ophthalmology. Modern dentistry has added the construction of obturators, of regulating appliances, the making of crowns and bridges, porcelain work, and other prosthetic appliances, to say nothing of the operative department, which is essentially prosthetic, and thus a large and essential proportion of the practice of dentistry may be included in prosthesis.

The systems of professional instruction in Europe and in America vary widely. In the former country nothing can be incorporated in the college curriculum except that which is medical. As medicine teaches no constructive methods it necessarily follows that, theoretically at least, all the various branches of prosthesis are outside the curriculum of study of the qualified dentist. In America, with the founding of separate schools, all the practice of dentistry was incorporated in the curriculum, and our colleges now teach every branch of practice, whether it be medical or constructive. The two systems are widely at variance, and neither can under present circumstances recognize the other. The European schools decline to approve the American curriculum because it is not strictly medical. The American schools cannot accept the European curriculum because it covers and gives instruction in only a portion of that which is here accepted as dental practice, the prosthetic work being entrusted to an irresponsible and often unqualified practitioner, to whom the dental student must be bound by a sort of apprenticeship.

Here exist discrepancies and differences which absolutely forbid

the recognition of the curriculum of one country by that of another. The profession of dentistry in our country may be a far different thing from that in another. European graduates desiring to take an American course of study are by our regulations found very deficient, inasmuch as they have probably received no acceptable instruction in that which forms the greater part of the American practice of dentistry. European laws refuse to acknowledge our diplomas because they are not medical and because they represent a curriculum of college study which is so much broader than that of Europe.

Medical practice and dental practice should be the same the world over. Science knows no boundary laws, and should not be restricted by seas or rivers or artificial lines. The present tendency is toward a harmonization of these seemingly almost irreconcilable differences. Each of the systems presents certain advantages and certain imperfections. If that of Europe is insufficient, its curriculum at least is carefully guarded. Professional study is conducted in old established institutions, or in those that have affiliations with such. The schools usually have endowments, or receive state aid, which makes them quite independent of the fees received from students. They have state supervision, which forbids the lowering of the standard. Teachers are paid regular salaries. This at first seems highly to be desired in all cases, but it should be remembered that it has a tendency to segregate instructors from the profession and from professional feeling. Their sympathies are not so complete when under salary as when they are obliged to keep in close affiliation with the profession if they would reach any degree of success.

In America, on the other hand, the first organized dental colleges were segregated from the medical schools and universities, dependent entirely upon the fees of students, and hence were in a sense speculative institutions. So long as they were conducted by men of high aspirations and ideals this did not so much matter, but in due process of time some of them fell under the conduct of those who possibly might be selfish, and who desired to graduate the greatest number of students for the sake of the fees involved. This is the weakness of the American school, but of late the colleges here have begun to affiliate with universities and are under their control. While they are not endowed institutions, and in some cases are in a measure dependent upon the fees of the students for the remuneration of the teachers, their university affiliation is a check upon any

undue selfishness or unprofessional conduct on the part of their governors.

The tendency of the early schools in some instances to become mere commercial enterprises, they being under no restraint of law or of university affiliation, resulted in a depreciation of the educational standard in this country. Especially was this manifest in the reception of foreign students, who, it has been charged, were received into the senior classes and graduated at the end of a very few months, sometimes almost without any preliminary qualifications whatever. Abuses of the college privileges by unworthy men finally resulted in the formation of the National Association of Dental Faculties, which has wrought some of the most surprising changes that have ever been brought about, even in dentistry. The standard has been steadily raised, recalcitrant schools disciplined, and with the aid of the state laws and the state boards of dental examiners, all the present recognized schools are maintaining a standard which, if not now as high as it should be, bids fair within a short time to reach the highest standard of excellence. But the diplomas of these schools are not now accepted in Europe, nor are European licenses for practice recognized in this country as the equivalent for the completion of our courses of study.

Two years ago an international dental congress was held in Paris, at which these things were considered and a permanent educational section was established, which held its first meeting last summer in Cambridge, England. There were representatives from seventeen nations present, taking part in the deliberations and proceedings. Very little could be then done, as it was really only a preliminary meeting, but provisions were made for holding another meeting this summer, which should be made up of representatives from every nation having a legal dental system of education.

It is probable that the meeting will have a greater influence upon the dentistry of the future than any ever yet held. It is called at Stockholm, Sweden, for August 12 next. As it is comparatively new, few American dentists or American teachers have comprehended its scope or its possibilities. That there might be a large delegation from America it became necessary to change, if possible, the time of the Niagara meetings, as the success of the Stockholm gathering would be seriously jeopardized unless it could be held early in August. The effort to secure this change resulted in some

misunderstandings. It was believed by a part of the profession that a few dentists who wished a pleasure jaunt abroad desired to inconvenience all the rest of the profession. Others received the impression that representatives of a few schools were laboring to obtain some special privileges or recognition in Europe, from which the others should be excluded, and that it was not for the interests of the schools generally that these selfish purposes should be ministered to by changing the date. Better counsels finally prevailed, however, and the whole matter has been harmonized so that no one will be inconvenienced.

So far as we can learn, the Stockholm meeting means a federation of the educational interests of all countries, and as far as possible the adoption of a uniform standard of instruction which shall be recognizable in all the countries, so that a student of one nation going to the school of another may obtain due credit for the instruction which he has already received. This means the unification of dentistry, the elevation of it to a higher plane, and the advancement of the interests of the schools of all nations. There can be no selfish end gained by any school which desires to maintain a high standard, because none under such a system can by any possibility be excluded from the benefits which all may derive, provided only that it is a properly equipped and conducted school.

The meeting means the drawing of a line which shall distinguish our American schools, the members of the National Association of Dental Faculties, from the unrecognized and fraudulent schools which have been organized here—always, so far as we are aware, by foreigners. It means a dental faculties' association which shall embrace the whole world. Such an organization could not possibly exclude any competent school, for it could not be conducted according to the exclusive laws of any one nation. We believe that the best interests of dentistry, and especially of American dentistry, demand that a large delegation shall attend the Stockholm meeting. Every school which is a member of the Faculties' Association should be represented. If it cannot send a member of its own faculty, it should delegate some one else in whom it has confidence to act for it.

It is not to be expected that all the benefits to be derived from such a federation shall be obtained in one year, any more than the good work of the N. A. D. F. has been confined to a single session,

but it will inaugurate an era of fellowship and set in motion a train of events which ought to result in infinite good to dentistry everywhere. Of course none of its legislation could be accepted in America until it had been ratified by the Faculties' Association, but certainly its possibilities are almost without limit. There should and probably will be a thorough consideration of all these matters at the coming Niagara meetings. A fair understanding as to what is desired to be accomplished, and what shall be advocated by American representatives, should be decided upon at that time. Those who attend the Stockholm meeting will then know upon what they can depend. It is undoubtedly the case that some concessions must be made by all concerned if any standard acceptable to all countries shall be adopted. It is not, however, at all probable that anything positive or definite will be decided this summer, but it is certain that at least an agitation will be inaugurated which shall result in a better understanding of the various systems of dental education by the profession in all countries. W. C. B.

ARMY AND NAVAL DENTAL BILLS.

Our readers are undoubtedly aware that for some time past strong efforts have been made to obtain the passage of a bill to provide dentists for the Navy. The first bill stipulated that the appointees be commissioned, just as are those in the medical corps, and this demand caused considerable delay. First, because some of those in authority thought that the dental corps should not be of equal rank with the medical department; and second, because others claimed that the dentists in the Navy should have no better standing than those in the Army.

Dr. Wms. Donnally of Washington, who secured the passage of the bill providing dentists for the Army some time ago, has been the leading spirit in this matter of the Navy dental bill. When he discovered the obstacles in the path of same he directed his efforts towards inducing the Surgeon General of the Army to recommend a commissioned corps of dental surgeons for the Army, as he had promised to do some two years before. Sternberg agreed to this, and as the Surgeon General of the Navy had promised to act in accord with the Army Surgeon General, the time was ripe for the two bills—one reorganizing the Army dental corps and making it a

commissioned body and the other adding a commissioned corps of dental surgeons to the Navy.

On April 25, 1902, Senator Pettus offered in the Senate bill No. 5420 for the Army and bill No. 5419 for the Navy, and duplicates of these two bills were offered in the House of Representatives by Mr. Brownlow of Tennessee on April 25 for the Army and by Mr. Joy of Missouri for the Navy on April 24. The four bills were referred respectively to the Committee on Military Affairs and to the Committee on Naval Affairs at once. Thus far the committees have not passed on same, but there seems to be little room for doubt that both bills will become laws without trouble or delay. We reproduce the two bills herewith:

S. 5420. A bill to reorganize the corps of dental surgeons attached to the Medical Department of the Army.—*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That to the Medical Department of the Army there shall be attached a corps of dental surgeons, which corps shall not exceed in number the actual requirements nor the proportion of one to one thousand authorized by law for service in the Regular Army.

The said dental corps shall consist of three grades, designated assistant dental surgeon, passed assistant dental surgeon, and dental surgeon, and with respect to rank, pay, and allowances and to promotions within said dental corps, the grades named shall correspond to the grades of the medical corps designated assistant surgeon, passed assistant surgeon, and surgeon, respectively.

Sec. 2. That original appointments shall be made to the grade of assistant dental surgeon, and the appointees must be citizens of the United States between twenty-two and twenty-nine years of age, graduates of standard dental colleges, of good moral character, of unquestionable professional repute, and shall be required to pass the usual physical examination and a professional examination which shall include tests of skill and proficiency in practical dentistry and the usual subjects of a standard dental course: Provided, That contract dental surgeons attached to the Medical Department of the Army at the time of the passage of this Act may be appointed, three of them to the grade of passed assistant dental surgeon and the others to the grade of assistant dental surgeon.

S. 5419. A bill to add a corps of dental surgeons to the Bureau of Medicine and Surgery of the Navy.—*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That to the Bureau of Medicine and Surgery of the Navy there shall be attached a corps of dental surgeons, which corps shall not exceed in number the actual requirements

nor the proportion of one to one thousand authorized by law for the naval and marine military service and training schools.

The said dental corps shall consist of three grades, designated assistant dental surgeon, passed assistant dental surgeon, and dental surgeon, and with respect to rank, pay, and allowances and to promotion within said dental corps, the grades named shall correspond to the grades of the Medical Corps, designated assistant surgeon, passed assistant surgeon, and surgeon, respectively.

Sec. 2. That original appointments shall be made to the grade of assistant dental surgeon, and the appointees must be citizens of the United States between twenty-one and thirty years of age, graduates of standard dental colleges, of good moral character, of unquestionable professional repute, and shall be required to pass the usual physical examination and a professional examination, which shall include tests of skill and proficiency in practical dentistry and the usual subjects of a standard dental course: Provided, That there shall be first selected a member of the dental profession who is a citizen of the United States and a graduate of a standard dental college and whose aptitude and experience evidence eminent fitness for conducting the professional examinations and for assisting in organizing, equipping, and supervising the operations of the others, who shall be first appointed to the grade of dental surgeon: Provided further, That the dentist now employed at the Naval Academy shall not be displaced by the operation of this Act.

Notices.

ARKANSAS STATE DENTAL ASSOCIATION.

The Arkansas State Dental Association met at Little Rock May 12-14, 1902, and elected the following officers: Pres., Chas. Richardson; 1st V.-P., A. L. Pendergrass; 2nd V.-P., R. W. Quarles; Secy.-Treas., T. W. Rowland.

NORTHERN OHIO DENTAL ASSOCIATION.

The forty-third annual meeting of the Northern Ohio Dental Association will be held at Cleveland June 9 11, 1902. The profession is cordially invited to be present.

W. T. JACKMAN, Cor. Sec'y, Cleveland.

NEW ENGLAND ASSOCIATION OF DENTAL EXAMINERS.

This Association assembled for its sixth annual meeting and banquet at Hotel Brunswick, Boston, Tuesday evening, April 22, 1902. The discussions after dinner were on "Methods of Conducting Examinations," and "Enforcement of the Dental Laws." There was a good attendance from the different state boards and of honorary members who were formerly on the state boards. Drs. William Carr and William Jarvie of the New York board, and Dr. Chas. A. Meeker of the New Jersey board, were guests of the Associa-

tion. The following officers were elected: Pres., D. W. Fellows, Portland, Me.; V.-P., P. J. Heffern, Pawtucket, R. I.; Recorder, Geo. A. Maxfield, Holyoke, Mass.; Chairman Ex. Com., John F. Dowsley.

Geo. A. MAXFIELD, Recorder.

IOWA STATE DENTAL SOCIETY.

This Society held its annual meeting at Des Moines, May 6-8, 1902, and elected the following officers: Pres., R. S. Bandy; V.-P., Wm. Fynn; Sec'y, W. B. Clack; Treas., T. A. Gormley. The next annual meeting will be held at Sioux City.

OKLAHOMA STATE DENTAL ASSOCIATION.

This Association held its annual meeting at Guthrie, May 6-7, 1902, and elected the following officers for the ensuing year: Pres., J. A. Wells; V.-P., C. H. Stalford; Sec'y and Treas., W. L. Pembleton. The next meeting will be held in Oklahoma City.

LOUISIANA STATE DENTAL SOCIETY.

The annual meeting of this Society was held at New Orleans, May 7-8, 1902, and the following officers were elected: Pres., M. R. Fisher; 1st V.-P., P. J. Friedrichs; 2d V.-P., W. Wood; Rec. Sec'y, H. P. Magruder; Cor. Sec'y, A. L. Plow; Treas., C. Mermilloid, Sr.

WISCONSIN STATE DENTAL SOCIETY.

The thirty-second annual meeting of the Wisconsin State Dental Society will be held at Milwaukee, July 15-17, 1902. A cordial invitation is extended to all members of the profession to be present.

W. H. MUELLER, Sec'y, Madison.

NATIONAL DENTAL ASSOCIATION.

In accordance with the result of the recent postal card vote, the date of the coming meeting of the National Dental Association will be changed from the first Tuesday of August to Monday, July 28, and will continue four days.

A. H. PECK, Rec. Sec'y, Chicago.

HARVARD DENTAL ALUMNI ASSOCIATION.

The place of meeting of the Harvard Dental Alumni Association for the thirty-first annual banquet, Monday evening, June 23, 1902, has been changed from Young's Hotel, Boston, to the Harvard Union, Cambridge, Mass.

WALDO E. BOARDMAN, Sec'y, Boston.

MARYLAND STATE DENTAL ASSOCIATION AND DISTRICT OF COLUMBIA DENTAL SOCIETY.

The sixth annual union meeting of the Maryland State Dental Association and the District of Columbia Dental Society will be held in Washington, D. C., June 6-7, 1902.

M. F. FINLEY, Chairman Pub. Com.

NATIONAL DENTAL ASSOCIATION—SECTION IV.

Those who will present papers upon the subjects of Etiology, Physiology, Hygiene, Prophylaxis and Electricity will kindly communicate with the chairman of the section, Dr. J. D. Patterson, Kansas City, Mo., or

EMMA EAMES CHASE, Sec'y., 3334 Wash. Ave., St. Louis.

FLORIDA STATE BOARD OF DENTAL EXAMINERS.

The annual meeting of this board for the examination of applicants to practice dentistry in Florida will be held at Daytona, May 27, 1902. Any information concerning the examination will be given by

F. B. HANNAH, Sec'y., Umatilla.

NEW JERSEY STATE BOARD OF REGISTRATION AND EXAMINATION IN DENTISTRY.

This Board will hold its next examination July 7-9, 1902, at the office of the secretary, J. Allen Osmun, 588 Broad St., Newark. All applicants must have their applications in two weeks prior to the examination.

J. ALLEN OSMUN, Sec'y.

VIRGINIA STATE DENTAL ASSOCIATION.

The Virginia State Dental Association will hold its annual meeting at Old Point Comfort, Aug. 5-7, 1902. All dentists in good standing are cordially invited to take this as the time for their summer outing, and to spend it with us at a place which is boundless in its resources for recreation.

GEO. F. KESSE, Sec'y, Richmond.

NORTH CAROLINA STATE BOARD OF DENTAL EXAMINERS.

The regular annual meeting of this Board will be held at Raleigh, June 16-18, 1902, for the examination of applicants for license to practice dentistry in that state. Practical demonstrations will be required, applicants furnishing their own instruments and material for operating.

R. H. JONES, Sec'y, Winston-Salem, N. C.

KANSAS STATE DENTAL ASSOCIATION.

The annual meeting of this Association was held at Hutchinson, May 8-10, 1902, and the following officers were elected for the ensuing year: Pres., W. A. Coston; 1st V.-P., T. I. Hatfield; 2d V.-P., J. W. O'Bryan; Sec'y, G. A. Easterly; Treas., G. F. Austrose; Supt. of Clinics, S. J. Renz; Mem. Board of Censors, W. A. McCarter. The next meeting will be held at Emporia.

GEORGIA STATE BOARD OF DENTAL EXAMINERS.

This board will hold its regular annual meeting June 10, 1902, in Macon, for the purpose of examining applicants for license to practice dentistry and for such other business as may come before it. All applicants will be required to exhibit their diplomas for record and examination before their names will be enlisted.

D. D. ATKINSON, Sec'y., Brunswick.

SOUTH DAKOTA STATE DENTAL SOCIETY.

The South Dakota State Dental Society will meet at Watertown, July 8-10, 1902. Porcelain work with gasoline furnaces will be one of the features of entertainment, and orthodontia will receive special attention. Clinics by leading dentists in gold and amalgam fillings will be given. The profession is cordially invited to attend.

G. W. COLLINS, Sec'y, Vermillion.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The nineteenth annual meeting of the National Association of Dental Faculties will convene in the ball-room of the International Hotel, Niagara Falls, N. Y., July 24, 1902. The executive committee will meet at 11 a. m., July 28. All colleges are respectfully referred to rule requiring that their annual announcement be in the hands of the executive committee at this meeting.

S. W. FOSTER, Sec'y Ex. Com., Atlanta, Ga.

CHICAGO DENTAL SOCIETY.

At the annual meeting of this Society, April 1, 1902, the following officers were elected for the ensuing year: Pres., E. MaWhinney; 1st V.-P., H. J. Goalee; 2d V.-P., F. B. Noyes; Sec'y, W. Girling; Cor. Sec'y, C. S. Bigelow; Treas., E. R. Carpenter; Librarian, H. W. Sale; Mem. Board of Directors, Edmund Noyes; Board of Censors, W. V-B. Ames, Chairman, C. N. Johnson, A. W. Harlan.

C. S. BIGELOW, Cor. Sec'y.

VERMONT STATE BOARD OF DENTAL EXAMINERS.

A meeting of the Vermont State Board of Dental Examiners will be held at the Pavilion Hotel, Montpelier, July 9, 1902, at 2 p. m. for examination of candidates to practice dentistry. Examination will be in writing, and will include Anatomy, Physiology, Bacteriology, Chemistry, Metallurgy, Pathology, Therapeutics, Surgery, Materia Medica, Anesthesia, Operative and Prosthetic Dentistry, and an operation in the mouth. Candidates must come prepared with instruments, rubber dam and gold. Applications, together with the fee of \$10, must be filed with the Secretary on or before July 1.

GEO. F. CHENEY, Secy. St. Johnsbury.

SOUTH DAKOTA STATE BOARD OF DENTAL EXAMINERS.

The next meeting of this Board for the examination of candidates will be held at Watertown, July 8-10, 1902. No applicant will be admitted unless he presents satisfactory evidence of having been in the active practice of dentistry continuously for at least three years immediately preceding the date of examination, or that he is a graduate from a reputable dental college. All applicants must bring operating outfits, dental engine and materials, prepared to do bridgework or fillings of all kinds. Applications must be made in writing to the secretary at least one week previous to the date of examination. Candidates must present themselves at 9 a. m., July 8, 1902, at Dr. C. W. Stutenroth's office. None will be received later.

G. W. COLLINS, Sec'y, Vermillion.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The nineteenth annual session will convene at the International Hotel, Niagara Falls, N. Y., July 25, 1902, at 10 a. m. and will continue in session until the adjournment. It is earnestly hoped that this meeting will see a larger representation than any heretofore held. Each state is asked to make provision now to send delegates. Niagara Falls is an ideal meeting place, and the International Hotel is the best; its service and appointments are first-class in every respect. Rates will be from \$3.50 to \$4.50 per day, according to location of room, being a reduction of 50 cents per day from the regular rates. It is expected that the usual reduction in railroad fare will be arranged in time. Further notice will be given later.

J. ALLEN OSMUN, Secy., Newark, N. J.

ILLINOIS STATE DENTAL SOCIETY.

At the annual meeting of this Society, held at Springfield May 13-15, 1902, the following officers were elected for the ensuing year: Pres., A. H. Peck, Chicago; V.-P., W. E. Holland, Jerseyville; Sec'y, H. J. Goslee, Chicago; Treas., C. N. Johnson, Chicago; Librarian, J. T. Cummins, Metropolis; Com. Science and Literature, G. V. Black, Chicago; Com. Art and Invention, L. S. Tenney, Chicago; Board of Examiners, C. B. Sawyer, Jacksonville; Com. on Ethics, E. A. Royce, Chicago, G. E. Warren, Pontiac, E. F. Hazell, Springfield; Supervisor of Clinics, C. P. Pruyn, Chicago; Mem. of Ex. Council, E. K. Blair, Waverly, D. M. Gallie, Chicago, O. M. Daymude, Monmouth; Pub. Com., H. J. Goslee, Chairman, Chicago, D. M. Cattell, Chicago, G. W. Dittmar, Chicago; Local Com. of Arrangements, F. H. McIntosh, J. B. Brown, G. D. Sitherwood, all of Bloomington. Bloomington was selected as the place for the next meeting.

LATEST DENTAL PATENTS.

- 695,625. Crown soldering pliers, F. E. Roach, Chicago.
- 695,796. Artificial denture, A. F. Cogswell, Crete, Neb.
- 696,120. Dental gauge, C. R. Vanderpool, Grand Rapids, Mich.
- 696,155. Guard attachment for engines. I. N. Williams, Sullivan, Ind.
- 696,545. Engine wall bracket, A. W. Browne, Princebay, N. Y.
- 696,652. Dental obtunder, A. F. Merriman, Jr., Oakland, Cal.
- 696,718. Dental lathe, J. J. Brown, Macon, Mo.
- 696,774. Articulator, J. Tiffin, C. E. Bentley, Pinos Altos, N. M.
- 696,772. Crown-slitting tool, G. W. Teufel, Philadelphia.
- 697,326. Dental appliance, G. H. Claude, Annapolis, Md.
- 697,963. Artificial denture, S. H. B. Cochrane, Canal Winchester, O.
- 698,280. Matrix band retainer, A. J. Hiniker, San Francisco, Cal.
- 698,964. Articulator, M. M. Kerr, Detroit, Mich.
- 698,997. Amalgam carrier, J. W. McConnell, Cornelia, Ga.
- 699,653. Vulcanizer, J. S. Campbell, London, Eng.
- 699,776. Impression tray, E. L. Townsend, Los Angeles, Cal.
- 700,160. Dental mallet, J. W. Thatcher, San Francisco, Cal.

AMERICAN DENTAL SOCIETY OF EUROPE.

The next meeting of this Society will be held in Stockholm, Sweden, Aug. 12-15, 1903. A cordial invitation is extended to the profession to meet with us. This date will enable those attending the National Dental Association meeting at Niagara to be present by sailing via Hamburg after that meeting. With a view of facilitating matters for those who purpose attending, I would say, that owing to the heavy booking of steamer berths it would be well for visitors to secure their return passages in advance. The best way to reach Stockholm is via Hamburg. (1) travel tickets only for the journey—Hamburg, Kiel, Corsor, Copenhagen, Malm, Stockholm, return to Hamburg by the same route, \$38 each adult, first-class; \$26 each adult, second-class. (2) travel tickets only for the route—Hamburg, Subeck, and steamer direct for Stockholm, returning to Hamburg by the same route, \$20 each adult first-class; \$15 each adult second-class. In the case of route No. 1 the validity is 45 days, and for route No. 2 the season. As much notice as possible should be given to secure accommodations. The time between Hamburg and Stockholm is as follows—Route No. 1: Leave Hamburg 8:58 a. m. or 11:07 p. m., arrive Copenhagen 6:54 p. m. or 10:05 a. m., leave Copenhagen 7:45 p. m. or 11:15 a. m., arrive Stockholm 11:25 a. m. or 6:45 a. m. Route No. 2: Leave Hamburg noon, 2 p. m. or 3:40 p. m., arrive Subeck 1:31 p. m., 3:32 p. m. 4:53 p. m., leave Subeck about 6:15 p. m., Wednesdays and Saturdays, the trip taking about 42 hours, but the time for the coming season is not yet fixed. Any further information can be obtained from Messrs. Cook & Sons, 261 Broadway, New York City.

L. J. MITCHELL,

Hon. Sec., 39 Upper Brook St., London, W. Eng.

NEW JERSEY STATE DENTAL SOCIETY.

In no one profession have there been so many kaleidoscopic changes in methods as in modern dentistry. The practice of to-day is succeeded on the morrow by an improved method. The mechanician, the electrician, the chemist, the microscopist, the histologist, the physician, the biologist, and the specialist of many phases, and the realms of *materia medica*, are all called upon to contribute to the avaricious maw of the present-day dentist.

The day has passed when the man can sit in his office, and read in a desultory way one dental journal, never visit a dental society, and call himself a dentist. The excellence of the professional man is due mostly to the stimulus of the societies. The more meetings he attends the better dentist he is. He must be up and doing and lead a strenuous life—the old order has passed away and the new is on. Show me a community where the societies are progressive and well attended, and the result is more men respected professionally and socially, all other things being equal.

A state dental meeting nowadays must be a post-graduate course in dentistry, and in the thirty odd years of its existence the New Jersey State Dental Society has tried to live up to the fact as an argument in dental education and evolution. With this argument emphasized, we ask you, the great body of ethical and progressive men in Jersey and adjacent states, to

cut off from your calendar July 16-18, and come to our meeting and let us give you ocular proof of the object lesson we will present in the wonderful exhibit of 1902. Up to-date electrical appliances, inlay furnaces, chairs, spittoons, improvements in gold and base metals for operative and mechanical work, new and ingenious instruments for the office and laboratory, porcelain teeth and crowns, and last of all, many clinics performed before you by eminent operators, that are of more value than a 12mo essay of descriptions.

Asbury Park is a pleasant place to visit. The railroad fares are reasonable, the hotel rates are moderate, the scenery is beautiful and the social element is all that can be desired. We will try and make your visit pleasant and profitable, and the accomplished members of the entertainment committee will assuage your thirst like an oasis in the desert. Last year seven hundred dentists registered an attendance; this year we look for an even thousand.

The Columbia will be the headquarters from which the Hornet's flag will fly. Proprietor J. H. Jones will try his best to accommodate all who favor him with the request in a reasonable time, with the rate of \$2.50 and \$3.00 per day.

The auditorium, the largest building on the Jersey coast, will be used in its entirety for the exhibits and meetings.

Again we ask you to out the time off now and meet with us.

CHAS. A. MEEKER, D.D.S., Sec'y.

H. S. SUTPHEN, D.D.S., Ass't Sec'y.

News Summary.

B. F. WRIGHT, 73 years old, a dentist at Camillus, N. Y., died April 9, 1902.

D. D. SMITH, 85 years old, a dentist at Syracuse, N. Y., died April 23, 1902.

CLARENCE BETCHER, 28 years old, a dentist at Red Wing, Minn, died April 30, 1902.

J. C. JONES, 81 years of age, a dentist at Webb City, Mo., died from paralysis April 26, 1902.

A. N. LAIRD, for many years a dentist at Muncy, Pa., died of neuralgia of the heart April 8, 1902.

A. M. KELSEY, 76 years old, and for many years a dentist at Rockford, Ill., died April 12, 1902.

J. C. SNELLING, 26 years old, a dentist at Elsie, Mich., died April 14, 1902, after a few days illness.

I. N. RUSSELL, 68 years old, a dentist at Waterbury, Conn., died April 12, 1902, after a long illness.

HENRY M. MILLER, 76 years old, a dentist at Westfield, Mass., died after a short illness April 9, 1902.

MARK VANCE, a dentist at Ottumwa, Ia., was found guilty of lewdness April 27, 1902, by a jury in that city.

F. L. GORGAS, 40 years of age, a dentist at Altoona, Pa., died April 24, 1902, from injuries sustained by a fall.

EDWARD EBI, 65 years of age, and the oldest dentist in Cedar Rapids, Ia., died suddenly of pneumonia May 12, 1902.

WILLIAM SELBACH, a dentist at Springfield, O., was adjudged insane and committed to the state hospital last month.

H. L. BANZHAF, of Manitowoc, Wis., has accepted the deanship of the dental department of the Milwaukee Medical College.

STILL IN DANGER.—Friend: "And are you out of danger?" Invalid: "Not yet. The doctor says he'll pay me two or three more visits"—*Ex.*

O. D. MUNSON, 90 years old, formerly a dentist in Auburn, N. Y., died suddenly May 12, 1902. He was one of the '49ers in the California gold fields.

COLUMBUS (O.) DENTAL SOCIETY at its April meeting elected the following officers: Pres., W. L. Gares; V.-P., H. M. Seamans; Sec'y, E. C. Sherman; Treas., E. M. Fisher.

BENJAMIN LORD, 88 years of age, a dentist in active practice in New York City for more than half a century, died May 3, 1902, as the result of injuries sustained from a fall.

POKER VERSUS DENTISTRY.—It has been suggested that the reason why some dentists are good poker players is because they are skilled in the arts of drawing and filling.

BRAIN WARMEST PART OF BODY.—Mosso has determined as the results of a series of experiments that the brain is the warmest part of the body.—*Canadian Practitioner.*

BANKRUPT.—DeV. Bowen, a dentist at Muncie, Ind.; liabilities, \$1,495, assets, \$400. G. H. Kriechbaum, a dentist at Los Angeles, Cal., debts, \$4,981.86, assets, \$1,750.

ALTERNATIVE.—Spinster Aunty: "O, doctor, what are we to do for Mary? Every time she sits down to eat that tooth hurts her." Doctor Practical Grumm: "Have her stand up."

DETROIT (MICH.) DENTAL SOCIETY held its annual meeting May 5, 1902, and elected the following officers: Pres., L. N. Hogarth; V.-P., D. C. Martin; Sec'y, W. H. Martmer; Treas., C. P. Wood.

JACKSON (MICH.) DENTAL SOCIETY held its regular monthly meeting May 12, 1902, and elected the following officers: Pres., F. Winchester; V.-P., J. W. Lyons; Sec'y and Treas., C. B. Blackmarr.

MISSOURI DENTAL COLLEGE ALUMNI ASSOCIATION held its annual banquet, April 23, 1902, and elected the following officers: Pres., DeCoursey Lindsley; V.-P., O. J. Fruth; Treas., C. E. Schumacher; Sec'y, H. Cassell.

STRONG TESTIMONIAL.—Your medicine has helped me wonderfully," she wrote to the patent medicine house. "Three weeks ago I could not spank the baby, and now I am able to thrash my husband. God bless you."—*Smart Set.*

CHLOROFORM AS A STYPTIC.—Excellent results have been obtained from a mixture of 1 part chloroform with 50 parts water, in rapidly arresting hemorrhage after tooth extraction.—Dr. Spaak, in *Jour. Med. Paris*.

SMALL POX CATCHES FAKIR.—Richmond, S. D., is having lots of fun. A "German Medicine Company" struck town, sold tubsful of dope, pulled hateful of teeth, and then the "doctor" took down with small pox.

SUNDAY DENTISTRY BARRED IN BOSTON.—Boston is having the "Blue Laws" with a vengeance, and last month dentists and photographers were added to the list of those who must do no work whatever on Sunday.

LAKE ERIE DENTAL ASSOCIATION held its thirty-ninth annual meeting at Cambridge Springs, Pa., May 6-8, 1902, and elected the following officers: Pres., C. T. Felt; V.-P., W. C. Dunn; Sec'y, C. D. Elliott; Treas., J. H. Heivly.

DOUBTFUL.—"Is your husband suffering from the toothache?" "Well," answered the woman with a tired expression, "He says he is suffering, but from the way he keeps bragging about it I am rather suspicious that he is enjoying it."

C. M. RICHMOND, 57 years old, and one of the best known dentists in New York City, died of pneumonia May 13, 1902, at Clarksville, Va., where he went six weeks ago to recover his health. He was the inventor of various forms of crown and bridge work.

ENGLISH AS SHE IS SPOKE.—"Wossatchooogot?" "Afnoonkicker. Lass-dition." "Lemmeesut." "Taykut. Nuthninnnet." "H'm! Paypsezzrain." "Yeh. Icanaliztellwenrainsoummin'. Canchoo?" "Naw. How?" "Bone-zake." "'Squeerl!"—*Chicago Tribune*.

VALLEY DISTRICT DENTAL SOCIETY OF MASSACHUSETTS held its annual meeting and banquet at Springfield, April 21, 1902, and elected the following officers: Sec'y, E. T. Dickinson; Treas., C. S. Hurlbut, Jr. Ex. Com., A. J. Flanagan, D. H. Allis, H. C. Medcraft.

SOUTHERN MINNESOTA DENTAL ASSOCIATION held its annual meeting April 15-16, 1902, and elected the following officers: Pres., A. C. Searle; V.-P., J. W. S. Gallagher; Sec'y, A. C. Rosenquist; Treas., M. B. Wood. The next annual meeting will be held at Mankato.

HARRIS DENTAL ASSOCIATION held its thirty-fifth annual meeting at Lancaster, Pa., May 7, 1902, and elected the following officers: Pres., D. S. Smith; V.-P., H. K. Baer; Sec'y, B. F. Witmer; Treas., W. H. Trout. Ex. Com., H. D. Knight, B. F. Witmer, W. H. Lowell.

WORST RESERVED FOR THE LAST.—"My dear fellow," said the dentist, "this doesn't hurt. It's not nearly as painful as it will be." "True," assented the howling subject, remembering that the bill was yet to be paid; and then he submitted with becoming meekness.—*Baltimore News*.

FOURTH DISTRICT DENTAL SOCIETY OF NEW YORK STATE held its annual meeting at Glens Falls, April 15, 1902, and elected the following officers: Pres., G. Brown; V.-P., L. A. Timerman; Treas., E. Doolittle; Sec'y, E. B.

Rhinehart; Correspondent, J. Barraclough. The next semi-annual meeting will be held in Schoenectady and the next annual meeting in Glens Falls.

SIXTH DISTRICT DENTAL SOCIETY OF NEW YORK STATE held its thirty-fourth annual meeting at Binghamton, May 8-9, 1902 and elected the following officers: Pres., F. M. Willis; V.-P., A. V. Needham; Sec'y, F. W. McCall; Treas., H. D. Whitmarsh; Censor, F. B. Darby.

EIGHTH DISTRICT DENTAL SOCIETY OF NEW YORK STATE held its annual meeting at Buffalo, April 29, 1902, and elected the following officers: Pres., G. B. Scott; V.-P., W. J. Leak; Rec. Sec'y, B. W. Whipple; Cor. Sec'y, G. W. Pringle; Treas., L. Meisberger; Librarian, S. A. Freeman.

PHILADELPHIA DENTAL COLLEGE ALUMNI ASSOCIATION held its annual meeting at Philadelphia May 1, 1902, and elected the following officers: Pres., F. M. Smith; V.-P., C. H. Chase; Rec. Sec'y, A. E. Irwin; Cor. Sec'y, M. Greenbaum. Directors, S. P. Luckie, H. Iredell, Henry McManus.

AGRICULTURE.—"Where did all these skeletons come from?" asked the visitor at the medical college. "Can you keep a secret?" queried the medical student. "Sure thing," replied the visitor. "Then I'll tell you," said the embryo M. D. and continued in a loud whisper, "We raised them."

SOUTHERN WISCONSIN DENTAL ASSOCIATION at its annual meeting at Janesville, May 15-16, 1902, elected the following officers: Pres., C. S. Bradley; 1st V.-P., H. F. Dean; 2nd V.-P., J. P. Baker; Sec'y, C. W. Culver; Treas., W. G. Hales. The next annual meeting will be held at Janesville.

THIRD DISTRICT DENTAL SOCIETY OF NEW YORK STATE held its thirty-fourth annual meeting at Albany, April 15, 1902, and elected the following officers: Pres., F. W. Ketner; V.-P., M. J. Barrett; Sec'y, C. E. Allen; Treas., J. W. Canaday. Ex. Com., G. A. Sullivan, J. W. Hine, C. H. Bird.

MAHONING VALLEY DENTAL ASSOCIATION held its semi-annual meeting at Youngstown, O., April 15, 1902, and elected the following officers: Pres., F. S. Whittlar; 1st V.-P., D. Gibbons, 2d V.-P., N. B. Acheson; Sec'y, G. B. Speer; Treas., H. E. Dunn. The next meeting will be held at Sharon, Oct. 20.

MILWAUKEE DENTISTS ORGANIZE.—The dentists of Milwaukee are forming an organization to protect themselves against dead beats. We wish them all possible success, but although several moves of this kind have been made in various parts of the country, we have never heard of one which was successful.

LEUCOPLAKIA.—J. V. Shoemaker gives the clinical histories of two cases and a general description of the disease. It calls for a differential diagnosis from syphilis, tuberculosis, epithelioma, chronic glossitis, and opaline patches. Shoemaker advises a cautious local therapy and the avoidance of escharotic measures.—*N. Y. Med. Jour.*

DAMAGE SUITS.—A dentist at Horseheads, N. Y., has been sued for \$3,000 damages by a woman who claims that he gave her an overdose of cocaine for the purpose of extracting some teeth, and that she has never recovered from the effects of same. A woman in Brooklyn sued a dentist to recover \$3 which she claimed she overpaid him. The judge threw the case out of court.

CONSUMPTION OF TOBACCO.—According to recent statistics, the average consumption of tobacco by each person in the various countries of the world is as follows: Netherlands, 3,400 grams; United States, 2,110; Belgium, 1,552; Germany, 1,485; Australia, 1,400; Austria and Hungary, 1,350; Norway, 1,335; Denmark, 1,125; Canada, 1,050; Sweden, 940; France, 933; Russia, 910; Portugal, 850; England, 680; Italy, 635; Switzerland, 610; and Spain, 550.

TETANUS FROM CARIOUS TOOTH.—*El Signo Medico*, describes a case of severe tetanus which developed suddenly in a young man with no apparent portal of entry. The presence of three carious teeth and the patient's habit of picking his teeth with pins, etc., suggested that a cavity in the teeth might be the focus of infection. The physician had them drawn at once and the mouth thoroughly disinfected every morning under chloroform. The case terminated in recovery.

OHIO'S NEW DENTAL LAW.—A new dental law passed the senate in Ohio last month. It creates a state dental board, to consist of five practicing dentists, to be appointed by the governor on June 1, 1908. All applicants must present diplomas from legally chartered dental colleges, and graduates of Ohio dental colleges are exempt from examination until June 1, 1905. Those persons who were legally practicing dentistry at the time of the passage of the act are also exempt from examination.

FIRES.—C. H. Allen, New Milford, Conn., had his office burned out April 30. Dr. Green at Modesto, Cal., had a blaze on May 3 which cost him \$100. S. Pugsley of Woodstock, N. B., lost all his office effects by fire on May 6. Fire started in the office of C. C. Pierce at Nacogdoches, Tex., on April 20, and caused him a loss of \$1,000. David Rosenbaum of Philadelphia, lost \$50 by fire April 29. Fire at Neenah, Wis., caused a loss of \$800 on April 14 to W. A. Traver. W. W. Willard at Red Oak, Ia., suffered a loss of \$1,600 by fire April 24.

ROBBERIES.—The thief who robbed a dentist at Quincy, Ill., and one at Keokuk, Ia., last month is reported as still doing business in that region. Two dentists at Clinton, Ia., lost respectively \$50 and \$75. An office at Kansas City was robbed of \$10 worth of gold on May 10. The thief who has robbed dentists all over California was arrested the latter part of last month in San Francisco. He confessed to having realized over \$3,000 from his plunder in the last six months, which of course does not represent anywhere near the actual value of the stuff stolen.

MARRIED.—W. R. Anderson, Grafton, N. D., May 1. E. H. Barker, Hopkinsville, Ky., April 30. H. I. Bragg, Columbia, Mo., April 23. R. C. Craycroft, Danville, Ky., April 17. C. R. Hammet, Portsmouth, O., April 24. W. F. Kratz, Oquawka, Ill., April 16. W. D. Lowry, Davenport, Ia., April 30. V. P. Luckstone, Cincinnati, O., April 24. W. R. McLeod, Timmons ville, S. C. April 16. W. J. Mathieu, St. Anne, Ill., May 14. H. McCuskey, Moundville, W. Va., April 18. W. H. Robinson, Hartford, Conn., April 27. C. Sample, Harvard, Neb., May 7.

ACCIDENTS.—A vulcanizer in the office of C. W. Andrews, Wayland, Mich., blew up April 28, and considerably damaged the office but missed the doctor. The same thing occurred in the office of D. C. Patterson, Cynthia, Ky., May 18. J. A. Webb of Portland, Conn., had his office damaged to the amount of \$75 on April 17 by a similar explosion. R. D. Griffiths of Paris, Tex., was exhibiting a blow-pipe of his own invention on May 14 before the Texas State Dental Association, when the gas reservoir connected with his apparatus exploded and seriously injured him. He may lose his arm in consequence.

SUPRAORBITAL REFLEX IN FACIAL PARALYSIS.—Joseph Sailer (*Phila. Med. Jour.*) speaks of the demonstration of the supraorbital reflex by D. J. McCarthy. He reports three cases which appear to prove that McCarthy's reflex is a true sensorimotor reflex, and that irritation of the supraorbital nerve may, under certain circumstances, produce contraction of the muscles of the opposite side. Also that in certain cases the reflex manifestation may extend to the other muscles which are removed to a considerable distance from the supraorbital nerve. In two of the cases there was loss of ability to move the platysma.

FAKIRS SUCCESSFUL IN OHIO.—Three Jews struck Springfield, O., in January and started the "Union Dental Co." They hired thirty or forty young girls who made a house-to-house canvas of the city, and induced poor people to sign a contract to have a certain amount of dental work done and to make a deposit in advance. These girls were not paid for their services, but were hired on the promise that whichever one brought in the largest number of contracts within a month would receive employment. What dental work these swindlers did was crude and practically worthless. It is estimated that before skipping out they cleared about \$2,000. Verily, a sucker is born every minute.

FATALITIES.—The wife of the Chilean counsel at Oakland, Cal., was seized with spasms on May 9, while having her teeth extracted, and died a few hours after. A man died in New York May 7 from blood-poisoning following the extraction of a tooth and laceration of the gum around it. A man at Homestead, Pa., is dying from blood-poisoning. While having dental work done recently the bur slipped from the tooth and passed through his tongue. A man at Hazleton, Pa., is dying from blood-poisoning resulting from the extraction of a tooth. A man in Ensley, Ala., recently had a tooth pulled, and a few days later inflammation set up in the glands of his neck. His condition is serious.

ILLEGAL PRACTITIONERS.—Last month a fakir went through Connecticut extracting teeth for twenty five cents each, and when he had taken in enough to pay his fine two or three times over he was arrested for practicing dentistry without a license. The court found him guilty on six different counts, and bound him over to the superior court under bond. This is the third time he has been caught. May 18 a young dentist in Brooklyn was held in \$800 bail for practicing without a certificate. April 21 a dentist at Everett, Wash., was fined \$50 for failure to have a license. April 24 a den-

tist at Vineland, N. J., was arrested for illegal practice. He immediately began suit in the supreme court for \$5,000 damages for false imprisonment against the county prosecutor of the state dental board. A dentist at Kelseyville, Cal., was fined \$50 last month for violating the dental law, and another at Los Angeles was arrested on May 9 for the same offense. A dentist at Baltimore was arrested April 23 for being without a license, and the same fate overtook an individual at Cass Lake, Minn.

MUCOCELE OF FRONTAL AND MAXILLARY SINUSES ON SAME SIDE.—Luc (*Archiv. Internat. de Laryngol.*) reports a case which occurred in a lady, aged twenty-nine with a swelling of the infraorbital region, and of part of the forehead on the left side. It was associated with rarefying osseous lesions. There was pain, and the eye was displaced down and out with accompanying diplopia. The frontal mucocele had existed for seven years, the maxillary for two years. The frontal sinus was opened by the Ogston-Luc method, and contained a quantity of clear yellow fluid, slightly viscid fluid. There were no granulations, the lining membrane being of normal pale color. The maxillary sinus was opened by the Caldwell-Luc method, and was found to contain no granulations, but simply a yellow, turbid, viscous, non-fetid fluid.

EXAMINING BOARD AFFAIRS.—Dr. H. A. Wilson, of Baltimore, has been appointed a member of the Maryland State Board of Dental Examiners by the governor.—On May 12 the governor of Wisconsin appointed Dr. L. L. Leslie of Janesville as a member of the State Board of Dental Examiners, to succeed Dr. W. G. Oliver of Oconto, whose term expired May 2.—The dentists of South Dakota have attacked the constitutionality of the law requiring each practitioner to pay an annual registration fee of \$2, and the case is now being argued before the lower courts.—For the first time since the organization of the Iowa State Board of Dental Examiners that body has surrendered to the state the surplus from the fees received for examinations. On May 12 the board turned over to the state what was left in the treasury.—The Appellate Court of Kentucky has affirmed the judgment of the lower court in the case of the State Board of Dental Examiners versus an individual who tried to compel the Board to issue him a certificate upon a diploma from the Western University of Chicago. The Court holds that the Board has discretionary power where proof of the character of the college or authenticity of the diploma is wanting.—The governor of New York State has signed the bill to amend the law relating to the practice of dentistry. This amendment seems to be a step backwards.

DENTISTRY IS SURGERY—Last month a judge in St. Louis decided that "The extraction of a tooth by one lawfully authorized to practice dental surgery may properly be classed as a surgical operation." The plaintiff in the case carried an accident insurance policy, and when his jaw was broken by a dentist while extracting a tooth, and he was laid up three weeks, he brought suit against the company for \$10 dollars a week. The policy contained a clause that there would be no liability because of injury from surgical treatment. The insurance company's attorney claimed that surgical

treatment included dental surgery, and the court upheld the contention. It behooves us to examine the ruling and discover what will be the logical result of its application. If having one's jaw broken by a dentist (professionally) is not an accident, it must be a design. The plaintiff in this case therefore visited the dentist with the deliberate intention of having his jaw broken, thinking to collect damages therefor. However, he did not reckon on the shrewdness of the judge which would penetrate his motives and unmask him before the world. Had he been successful there is no telling how many persons would have taken out a \$10 accident policy and had dentists break their jaws, for anyone would gladly have his jaw broken for that amount. Again, if jaw-breaking is a design, the dentist is equally responsible with the plotter, for it is not by accident that he breaks jaws.

DEFENDANT'S RIGHT TO A PERSONAL EXAMINATION.—The court of appeals of Kentucky has reversed a judgment (*Louisville & Nashville Railroad Co. vs. Simpson*) given for an alleged stiffness of two fingers. No other permanent injury was claimed, nor was the injury of the member apparent on inspection. At the trial she showed the hand to the jury, demonstrating how far she could close her fingers by the use of the muscles, and stated that the leaders and joints of the fingers were stiff and enlarged. A witness for the plaintiff testified that he could not tell by an examination of the hand whether it was permanently injured but he would have to rely upon the statement of the patient. She submitted her hand to examination while he was testifying. Subsequently the company introduced two physicians as witnesses, who testified that they could tell by an examination of the hand, without reference to what the plaintiff said, whether it was stiffened as claimed, and whether such injury was permanent. The physicians who testified for the defendant were not allowed to examine the hand, and the trial judge overruled a motion compelling her to submit to their examination. The court of appeals held that this ruling was reversible error; to permit the party suing to testify that the member was injured permanently and to deny to other competent witnesses an opportunity to examine the hand and to demonstrate if they could that it was not in fact injured, was an abuse of the discretion lodged in the trial judge—*Jour. A. M. A.*

DENTAL COLLEGE COMMENCEMENTS.—Atlanta Dental College, Atlanta, Ga., April 28, 1903, 45 graduates. Baltimore College of Dental Surgery, Baltimore, Md., April 29, 67 graduates. Baltimore Medical College, Dental Department, Baltimore, Md., May 1. Birmingham Dental College, Birmingham, Ala., May 6, 11 graduates. Central College of Dentistry, Indianapolis, Ind., May 1, 16 graduates. Chicago College of Dental Surgery, Chicago, Ill., April 29, 208 graduates. Cincinnati College of Dental Surgery, Cincinnati, O., May 9, 10 graduates. Des Moines College of Dental Surgery, Des Moines, Ia., May 1, 11 graduates. Indiana Dental College, Indianapolis, Ind., April 29, 65 graduates. Kansas City Dental College, Kansas City, Mo., April 29, 29 graduates. Keokuk Dental College, Keokuk, Ia., April 14, 18 graduates. Louisville College of Dentistry, Louisville, Ky., May 8, 70 graduates. New Orleans College of Dentistry, New Orleans, La., May 6, 17 graduates. North

Pacific Dental College, April 30. Omaha College of Dentistry, Omaha, Neb., April 30, 16 graduates. Ohio Medical University Dental College, Columbus, O., April 15, 49 graduates. Ohio College of Dental Surgery, Cincinnati, O., May 8, 90 graduates. Pennsylvania College of Dental Surgery, Philadelphia, Pa., May 1, 90 graduates. Philadelphia Dental College, Philadelphia, Pa., May 2, 113 graduates. Pittsburg Dental College, Pittsburg, Pa., April 30, 52 graduates. University of Buffalo, Dental Dept., Buffalo, N Y., May 6, 63 graduates. University of Illinois, School of Dentistry, Chicago, Ill., May 3, 40 graduates. University of Maryland, Dental Dept., Baltimore, Md., April 30, 58 graduates. Vanderbilt University, Dental Dept., May 8, 20 graduates.

IN MICROBE HOLLOW.—Dr. Bacillus; Hem! very serious case. Total loss of vitality. Just called me in time. You must move to a healthy, congenial



resort and recuperate. I would advise a season in the tenement district of New York. It will strengthen and fatten you.—*Life*.

BLOOD SUPPLY; ITS EFFECT ON THOUGHT.—Under the name of "muscle-bed," says *American Medicine*, a device has been invented by Dr. William Anderson, of the Yale gymnasium, for testing in the horizontal human body the distribution of the blood-supply under the effect of thought and exercise, and of ascertaining the center of gravity. This apparatus rests on very accurately made knife edges, and is sensitive to the slightest pressure; it is furnished with levels, graduated scales, and indicator for recording. A body perfectly balanced on the sensitive knife edges of the muscle-bed will be affected by additional weight on either side of the point of equilibrium, causing the head to settle if the flow of blood is in that direction, or the feet to lower if the flow is toward them. In the case of a subject balanced on the muscle-bed who is told to answer some question requiring thought, although not a muscle was moved the rush of blood to the head caused by the mental effort created a change of the center of gravity.

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No. 6.

Original Contributions.

REMINISCENCES AND THINGS.

By J. S. CASSIDY, D.D.S., COVINGTON, KY. READ BEFORE THE KENTUCKY STATE DENTAL ASSOCIATION, MAY 14 16, 1901.

Some twenty years ago, more or less, an epidemic of dental pulp preservation spread throughout the profession. Extraordinary efforts were made in that laudable direction, and wonderful stories were told of the uniformly successful results following certain lines of treatment. Formulae for the purpose were presented in and out of meeting and in print, and nearly all of them were highly recommended by eminent practitioners.

Each preparation intended for capping was so perfectly constituted that when applied as a covering to the pulp that unsophisticated organ was fooled into the belief that its brief experience of exposure to the awful heat and cold of the outer world was only a horrible dream. Whether the pulp realized later on that its former sufferings were not a dream was decided—too often in the affirmative, alas—by the other dentist.

Preposterous as it seems, according to our present knowledge of physiology, the suggestion was made in good faith that we could supply nutriment to the pulp from the outside, and, for instance, lacto-phosphate of lime was for quite a while the most plausible and favorite preparation for this purpose. Once at a state meeting the writer heard a prominent member enthusiastically contend that it was good practice to cut into the dentin for the proper food, and permit the fine powder thus formed by the sharp bur to fall upon the hungry pulp like "the gentle dew from heaven upon the thirsty earth."

Then came the idea of amputating the superfluous exposed tissue, so the "flap operation" was described, also the subsequent union by first intention of the healthy excised edges.

About this period our fellow member, Dr. Wm. Van Antwerp, on

leaving his office one summer afternoon for his home in the country, bought a porterhouse steak for supper. After going a little way he noticed the brown paper wrapped around it was softening through the warmth of his hands and the influence of the meat juice. He happened to be passing near a cluster of paw paw bushes, so reenforced the weakening paper with a few leaves. Perhaps the doctor unconsciously remembered the custom immemorial among the Indians of placing for a time the beef from any tough old buffalo between fresh leaves of the paw paw to make it more tender. At any rate he was not alarmed, as others might have been, when he discovered on reaching home that his steak presented in spots a peculiar semi-digested appearance where it had become in contact with the leaves. On the contrary, the incident made him happy in the thought that perhaps the paw paw might supply us with a remedy that would supersede the existing methods of doing away with undesirable portions of the dental pulp. In a paper on "Papain" read before the International Dental Congress at Paris last year, Dr. Harlan gave Kentucky full credit for introducing the practical idea of pulp digestion, but so far as the writer knows, Dr. Harlan is entitled to the credit of first using papain for the purpose suggested.

Papain is obtained from the common paw paw (*carica papaya*). The best variety probably comes from the milky juice of the unripe fruit. It is a white powder, soluble in water and glycerol; the latter preserves it from degeneration and does not interfere with its digestive powers. Papain converts fibrin into peptone, whether the solvent solution be acid or alkaline. It is non-poisonous, neither caustic nor astringent, and on account of its digestive virtues has been used in medicine as an aid to the normal functions of the stomach, and for the removal of false membranous growths, such as form in diphtheria, also to remove warts, tubercles, etc. It is inactive on healthy tissue. A more or less impure ferment, papayatin or papoid, changes starch into maltose and albuminoids into peptones. Take it all and all, the power of the paw paw to supply a good digester to either the boy in the woods or the patient under the doctor's care can not be questioned.

At the present time no strenuous effort is made to retain the dental pulp or any portion of it when exposed by disease, and it is recognized that mummifying those remains which cannot easily be disposed of with instruments makes the future value of the tooth an

uncertain quantity. In this accepted emergency in practice Dr. Harlan has presented us with papain, the best pulp digester thus far discovered. He suggests bathing the part with one-half per cent borax solution, and then applying a paste made up as follows:

Papain, - - - - - gr. j.

Glycerol,

Hydrochloric acid (1-300) - aa. gtt. j. m.

Let this paste stay sealed in place for from two to ten days, the time required for complete solution depending upon the quantity of dead pulp to be dissolved. Being a non-irritant, the preparation causes no uneasiness. The writer judges from limited personal knowledge that Dr. Harlan is not extravagant in his claims for papain, but whether the empty tortuous canals can be successfully filled is a matter to be decided by each individual operator.

Among the few really useful remedies of recent introduction to dental materia medica the drug known as orthoform is deserving of some consideration, as it has been used long enough to fully test its virtues. Chemically, it is the methyl-ester of para-amido-meta-oxybenzoic acid, and therefore belongs to the benzene class of organic compounds. It is a white crystalline powder of weak acid reaction, freely soluble in alcohol, sparingly and very slowly soluble in water, without odor, and produces no immediate effect on the sense of taste. At the end of two or three minutes a slightly bitter after-taste is noticed, followed by a gradually increasing numbness of the part. It is not a poison and may be used ad libitum. It possesses some antiseptic properties, is an excellent analgesic rather than anesthetic, and is applied to relieve pain in burns and scalds, ulcers of the tongue and other parts, after extraction of teeth, in dry socket, in pyorrhea, before and after operation, etc. For these purposes it may be employed in powder form or made into a solution or an ointment.

Just a few words in conclusion. We all gratefully recognize the fact that Dr. Miller has successfully proven for all time that lactic acid formed in the mouth is the solvent in true dental caries. To this most essential factor in the disease we have regarded as important adjuncts poorly constructed enamel, low density, uncleanliness, etc. By some thinkers, however, defective enamel and density have been eliminated from the discussion, and a few go so far as to hold that the manifest filth accompanying excessive dental caries is a

consequence and not a cause. They point accordingly for proof of their opinion to the apparent immunity from decay of the teeth in the mouths of innumerable adults which never receive attention from the brush or any other antiseptic treatment. The question then naturally arises, do the vital forces govern chemical changes in the mouth in a way analogous to the government of the other parts of the body, when involved in the process of destructive metabolism? One item alone as a text may suffice—nervous tissues are alkaline in reaction, but become acid through overwork and sometimes even from gentle exercise, the acidity being due to lactic acid and some uric acid. It seems therefore that ferments are not absent even in the gray matter, and are induced to become active in their several lines of work through fatigue, for instance, or other forms of so-called neuroses.

With these brief and rather crude statements in view, and in order to keep in touch with the evolution of at least a segment in the sphere of professional thought, it appears to be worth while to ask in humility—Is the inception and continuance, and their opposite phenomena, immunity from and spontaneous arrest of, dental caries due more to systemic influences rather than to purely local conditions?

A SUBSPECIALTY IN DENTISTRY.

BY C. M. WRIGHT, D.D.S., CINCINNATI. READ BEFORE THE CINCINNATI
ODONTOLOGICAL SOCIETY, JUNE 31, 1902.

In 1864 I read an essay before the Cincinnati Dental Society—the mother of this society—on "Specialties in Dental Practice," which was my first paper. At that time I could conceive of but two departments, the mechanical and the operative, and I offered arguments in favor of a division with all the optimistic assurance of youth.

About twenty-five years ago, in Basel, Switzerland, I mapped out a scheme for the practice of a new specialty of dentistry for a woman of education who applied to me for advice. She wished to earn a living, yet did not desire or feel able to enter into the full work of an accomplished dentist. I then planned for her the kind of work which shall form the subject of my talk this evening. She did not follow my suggestions and fit herself for the specialty, because it was not feasible at that time and place, but this circumstance did not affect my opinion of the excellence of the idea, and

I believe the time has arrived when we should make it possible for and encourage just such applicants to enlist in this field of useful service.

Ten years ago I explained the same scheme to another woman who sought advice about entering the profession of dentistry. This one was convinced by my picturesque and enthusiastic advocacy of the "Specialty within a Specialty," but as there appeared no opportunity for acquiring the education necessary for the practice of the vocation, she was compelled to abandon the plan. Soon after that she was enrolled as a student in a school of stenography, and now spends ten hours a day agitating a typewriter in a down-town business office.

The recent papers by Dr. D. D. Smith of Philadelphia on the prophylactic value of the expert polishing of the human teeth, beginning with the children, and having regular and frequent appointments and systematic attention in this one direction, and continuing it possibly throughout life, has appealed to me so forcibly that I have felt that suggestions on "A Subspecialty in Dentistry," devoted to the polishing of teeth and the massage of gums, might be apropos. I beg leave to offer the following outline of a scheme, the details of which seem easy of arrangement.

1. The practitioners of this separate and yet most important branch of dentistry are to be women of education and refinement, who are seeking a field for work of an honorable and useful kind and among people of culture.
2. The dental colleges are to offer opportunities for this partial and separate training. The course to consist of lectures on the Anatomy of the Teeth and Gums, Special Pathology and Physiology, and a special clinical training in prophylactic therapeutics.
3. Upon the completion of this special course, which shall require one session, or one year of study and practice under instruction in the college infirmary, and after presenting satisfactory evidence of proficiency in the polishing of teeth and caring for the mouth, the college shall grant a certificate of competence to the graduate of this course.
4. With this training and the dental college certificate, these women may be employed by dentists for this special work, or may practice the same at parlors of their own, or at the homes of patients, the dentists using their influence and recommending the new specialists, just as physicians and surgeons recommend and insist upon the services of the trained nurse or the masseuse.

I think every one of you will agree that there could be no more valuable service in oral hygiene than that which such a class of specialists would afford.

Dentists who treat pulps, fill teeth, make bridges, crowns and plates, treat inflammation and Riggs' disease, extract teeth and roots, and construct and care for regulating appliances, do not devote the proper attention to the careful polishing of all the surfaces of the thirty-two teeth, nor to the frequent massaging of the tissues which Drs. Smith, Talbot, and others advocate so strenuously as essential to the health of the human mouth. We as a profession have neglected these operations. We scale off the calcareous and other accretions at long intervals, often imperfectly, or partially and hurriedly, and with wheels and brushes on our electric engines whisk off the most conspicuous stains, leaving the teeth only comparatively presentable. We seldom perform the operation with satisfaction even to ourselves. Probably, in the light of the revelations made by Dr. Smith, the majority of us have never once thoroughly polished all the exposed surfaces of the teeth of our patients.

I think all would be glad to have this work done fortnightly or monthly by experts, for every patient who comes to us for so-called dental operations—viz., for crowns, fillings, bridges, etc.—and not only before coming, but at regular intervals afterwards *especially in conjunction with our surgical treatment of Riggs' disease.*

I have claimed that teeth are a luxury, but *clean* teeth—and by this I mean teeth each one of which has been polished on every surface by a skilled operator until it presents a finish only rivalled by some fine jewel—should be a badge of refinement that would place the child, the man, and the woman on a certain social plane. Polished teeth in this age of luxury, when the bath, the manicure, and the chiropodist are considered necessities, should form a subtle reason for an aristocracy of cleanliness which is next to godliness. Our ideas of the term *clean* have changed during the last twenty years. Then a man was clean who took a Saturday-night bath, a monthly shampoo, and shaved himself three times a week. Now we talk about "surgical cleanliness," and know about infections on toothpicks, and even upon smooth-looking enamel.

As we advance in the adoption of luxuries we get more particulars about daintiness, and this seems to be true in all things except-

ing with the teeth. I believe that it is largely due to us that this surgical cleanliness has not taken a more prominent place in the estimation of the general public. Our devotion to the diversified and exhausting mechanical operations which we are hourly called upon to perform, and on account of which we have gained reputation as a skilled and useful profession, has diverted our thoughts from what we call a minor operation.

Our energies, measuring as much per foot-pound as that of any other profession—law, medicine, or theology—have been fully expended on the many more brilliant operations in our surgical repertory, and we have neglected this one, which we all admit is as important as any in its relation to health. We have given ourselves over to restoration and been content to advise tooth-brushes, sanitol or vegetol to our patients, leaving the responsibility of real prophylaxis with them. We may not be able to change our modes and habits of practice, but we can, by this method, and with the hearty cooperation of the dental colleges in affording the educational equipment necessary for the cultivation of this field of special practice, revolutionize dentistry—place it upon a still higher plane. The operation suggested is more directly in the line of preventive medicine, with all that this implies, than any other in the scope of prophylaxis that I can think of, such as boiled drinking-water, ventilation, sanitary plumbing, physical exercise, diet, and bathing. Imagine a room full of children, as they are now in any school, public or private, in regard to surgically clean mouths, and the same children after a thorough polishing of all their teeth. Here is an opportunity for missionary work. Enthusiasm on the part of operator and patient could easily be stimulated, and health and morals be vastly improved. Ten years of such effort on the part of our profession would do more for the human family than all the tooth-pastes and powders ever invented, or all the tracts for the people ever published, for the responsibility would be removed from the patient and placed where it belongs—on the practitioner of this art of oral hygiene, these subspecialists.

We have set the men on pedestals who have been able to cut out a carious spot on a tooth, extend and form a cavity so that a clean surface of gold may take the place of enamel and protect one part of a single tooth from a single disease; shall we not commend and honor the specialist who patiently and regularly operates for the

prevention of this and other diseases by intelligent and systematic care of the entire mouth? This is a fundamental idea of dentistry, agreed to by all yet neglected.

With our present exact knowledge of etiology, and our increasing familiarity with the wide-reaching effects of oral sepsis, are we not ready for the establishment and hearty endorsement of trained specialists who will devote their entire time to this one branch of prevention? From personal observation among refined people in America and Europe, I believe success would follow the efforts of the colleges and the profession in this direction, for we shall be supplying an awakening demand for just such service.

REPORT OF SURGICAL CASES.

BY DR. G. LENOX CURTIS, NEW YORK CITY. READ BEFORE THE FIRST DISTRICT DENTAL SOCIETY.

I have not come to you with a paper, but with clinical reports of cases. I shall tell you the history of each case, how I operated, and show the results. In the larger number I will be able not only to show you the photographs and casts before the operation, but also the patients themselves, who have kindly consented to come here this evening. When invited to demonstrate some cases before you it was suggested that I should not go closely into the details of my work, so I confine my remarks to conditions and results, with only sufficient detail to enable you to better comprehend the situation. In looking over my cases I have endeavored to select those that would particularly interest the dental profession, yet at the same time would give you a fair sample of the scope of my work.

The first case I will show you is, as you see, one of lupus vulgaris, and is situated on the forehead near the left temple. The age of the patient is sixty years. Despite the fact that she had been almost constantly under treatment for the past twelve years, the disease had increased until, when I first saw her five weeks ago, it covered an area of about two and one-half inches. The treatment in this case consisted of high-frequency electricity (one million volts), lactate of silver, and permanganate of potassium. The disease was quickly stamped out and circulation in the part reestablished, so that now the wound is closed with the exception of the small granulating spot, about the size of a three-cent piece. Another week's treatment will, I think, be sufficient to complete the cure.

(Dr. Curtis reported July 20 that this case was completely healed ten days after demonstration, and that there was no sign of the disease returning.—Ed.)

This method of applying electricity is new, and as I am soon to demonstrate its value before the medical profession, in the treatment of chronic diseases, I will not expatiate on it at this time more than to say that it is a single-pole current, and has but one-sixth ampereage and a million voltage. In the treatment of cancer, neuralgia, etc., I have employed it with gratifying results. The pain, odor, and suppuration of cancer is dissipated in a few days, and the growth gradually diminishes, so that in from two to three months treatment the disease has been arrested, and healthy granulations have been established. This treatment I have applied in several inoperable cases, where the disease was situated in the mouth, and of such an extent that the patient was unable to swallow food. The action of electricity upon the growth was such as to reduce it sixty per cent under two months treatment, and enable the patient to take solid food.

I am now treating a case of carcinoma of the face, which shows every evidence of success. During the six weeks treatment almost every particle of diseased tissue was apparently destroyed, and the wound was filling in with healthy granulations. I here present a cast of the jaws, showing the results following an operation for removal of epithelioma from the upper left maxilla. There has been no return of the disease in these cases. I next show a patient upon whom I operated for similar trouble six months ago, and I will demonstrate the adjustment of one of these dentures. The results were eminently satisfactory. In all these cases I did not cut through the face in resecting the jaws, and because of this I attained better results, and there is no deformity.

Here is a cast of the face of a child aged five years who, when having a lower deciduous molar extracted, had the jaw broken. Her dentist and family physician treated it for some months, but did not recognize the fact that the jaw was broken until necrosis was fully established, as well as a sequestrum, extending from the cuspid tooth to the ramus, and protruding through the gums. On examination I found the periosteum was rapidly reproducing the bone, and that the patient was able to partially open the mouth, also that the malocclusion was but slight, notwithstanding the fact

that a splint had not been employed. I removed the sequestrum and encouraged the granulating tissue until the new portion of the jaw was of sufficient strength for mastication. The child had lost the second deciduous molar, and the germs of the first and second molars. The swelling of the face, as noticed in the cast, had not completely subsided when last seen.

I will present a young woman who met with a similar trouble at the hands of her dentist some five years ago, in having the first permanent right molar extracted. The patient stated that her dentist had treated her for a year and a half without putting on splints or telling her the jaw had been broken; that all this time the face had been badly swollen, that she had been unable to take solid food, also that this had prevented her from attending school. Upon examination I found the patient extremely anemic, suffering from blood-poisoning, hypertrophy of the right side of the face (due to cellular growth). The sequestrum was protruding from the gum, and all the teeth back of the first bicuspid were absent, with a history of their having been loose and removed.

There was an opening through the face just back of the angle of the jaw which was large enough to allow of passing my fingers through into the mouth. The bone back of the bicuspid (first) to the neck of the jaw, including the caroid process, was completely necrosed and exfoliating. This was removed, rendering the surrounding parts healthy. The wound was kept packed with gauze until new bone was formed of sufficient strength to support the remainder of the jaw, and to restore the contour of the face. The case responded quickly to treatment and the patient made a good recovery in two months, and is now, as you see, in excellent health. With the exception of the loss of the teeth, the enlargement of the face is the only remaining prominent feature.

There are two conditions in these cases to which I should like to call your attention. Had an interdental splint been adjusted at the time of the fracture, the bones would have probably speedily united. The long-continued treatment, the slowness with which the jaw exfoliated and the new bone was produced, made the change in the occlusion of the teeth at a minimum. The second condition—the hypertrophy of the cheek due to long-continued cellular inflammation. My method of reducing hypertrophy is by opening through the mucous membrane of the cheek and dissecting away sufficient cellular tissue to restore the contour of the face.

The next case is one which was referred to me nine years ago. The patient was at that time thirteen years of age, with the following history: At the age of seven she had both diphtheria and scarlet fever. Her throat and mouth were very sore and ulcerated. After she recovered from her sickness no attention was paid to the condition, and it was not until about a year later, when being treated by her dentist, that he found she was unable to open her mouth properly. The patient was taken to her physician, who stated that following the healing of the ulcers the parts contracted and held the jaws together by reason of the cicatrix. For several years unsuccessful efforts were made to correct this deformity, but the case was finally abandoned. In forcing food into her mouth the lower oral teeth were crowded back of the upper, which allowed the patient to take solid food. At the time I saw this patient I found her anemic and in a poorly nourished condition. Many of the temporary molars were in position, with the permanent molar crown protruding to one side. The gums were highly inflamed, and the first molars badly decayed, with one or more pulps exposed. The upper right central had been broken off, following decay.

This cast of the face which I present shows her thin face, protruding teeth, and receding chin. The ankylosis of the jaws was complete, but under ether I was able to force them apart by this system of jack-screws, which I designed to fit the case. Under this pressure I was able to break up the articulation on the right side, but was never able to make any appreciable impression on the left articulation, where the bony ankylosis seemed complete. With the assistance of her dentist, Dr. Joseph Kohn, I constructed interdental splints, between which this jack-screw was placed, screwed tightly, and allowed to remain half an hour at a time. This apparatus was applied several times daily and often allowed to remain during the night. Several times a year the patient was placed under ether, and the jaws were forced further apart. Owing to the lack of the development of the masticating muscles, due to non-use, the patient was at first unable to close her jaws, but by massaging and using them they slowly developed.

In the course of two years her teeth were filled, the gums rendered healthy, and the patient able to masticate food, although the lateral motion of the jaw was very limited. As the permanent teeth developed, from time to time new splints were required. I again

saw the patient in the fall of 1895, and found she had been able to maintain nearly all the space gained by previous operations. As her health continued to improve, I was able to force the teeth apart nearly one inch, which space she has, as you will see, been able to maintain with great comfort. You will also notice the great improvement in the form of the face, and that the lower teeth have been crowded forward and the upper ones have receded, until the occlusion is perfect. In 1897 the health of the patient failed, owing to pulmonary tuberculosis, since when no further attempt has been made to more than maintain the ground thus far gained. You will also notice that her articulation is distinct.

The next case I show you is a double hare-lip and cleft palate. This mask shows the condition of the child at the age of two months, when I operated. You will notice that the intermaxillary bone protruded forward beyond the lips about on a level with the nose. The nose was flattened. One unusual feature of this case was the fact that the cleft did not extend through the hard and soft palate. The operation consisted in freshening the edges of the cleft, burring a v-shaped notch in the palatal attachment, forcing the intermaxillary bone into position and suturing it with wire to retain it. Two weeks later I did the lip operation, leaving the redundant mucous tissue for the formation of a better lip. Two years later such tissue as was not utilized was removed. The child is now five years old, and as you will see, with the exception of some slight scars it has almost a perfectly formed lip and arch. The germs of the lateral incisors having been lost at the time of operation, the centrals do not come forward quite far enough to allow the incisors to occlude, but as the permanent incisors are now developing in front of these teeth I expect that the final result will be eminently satisfactory. In examining this case I should like to have you note the perfect condition of the roof of the mouth, the nares, and the nicely formed nose, also the perfect articulation of sound. This photograph of the child was taken at the age of two years and shows how quickly the nose and lip resumed its normal shape. The redundant tissue which the child drew back into her mouth at the time the picture was taken shows a dark shadow like the v-shaped notch which was usual in the earlier methods of operations for hare-lip. But as you see, there is still more redundant tissue than we require. To prevent this objectionable notch in the lip I am going to leave this as

it is for several years, and then operate with a view to removing the scars of the superfluous tissue.

I have largely followed Dr. Brophy's method in operating on these cases since he demonstrated it at the Congress during the World's Fair. The earlier the operation the better the result. I have operated as early as the second week.

Some one has asked whether in this case it would be wise to regulate the teeth so as to occlude with the lower incisors. In reply to this I would say, that the permanent incisors are erupted forward of the temporary incisors, and that they will probably occlude with the lower permanent teeth when erupted, but all of the rest of the teeth occlude properly, as you will see. If necessary the permanent teeth can be regulated.

Here is a mask of a young woman twenty-two years old, which shows the results following an operation by one of our most eminent surgeons in 1893, for the removal of necrosed bone on the right side of the lower jaw, caused by abscessed teeth. This was done before he had had an opportunity of seeing the more conservative methods in this operation, that is, from within the mouth. The pus had burrowed through the cheek, and the surgeon was led to believe that much of the jaw bone was necrosed. The incision, which was several inches in length, was made through the face along the lower border of the jaw, and all the jaw bone between the second bicuspid and the ramus was removed, including the periosteum. The ends of the bone were drawn together and held by silver sutures, and the wound in the face closed. You will see by the cast the deformity caused by the drawing of the left portion of the jaw around to unite with the ramus. There was a partial luxation of the left side of the jaw and a complete disarticulation of the teeth. A salivary fistula formed through the wound in the face, and for some unknown reason an ulcer several inches in length formed in the skin along the neck. The surgeon then placed the case in my hands, and my first move was to take out the sutures and draw the left portion of the jaw back into position, holding it there with an interdental splint. The wound in the face, which had not satisfactorily united because of the salivary fistula, was reunited with sutures and the saliva was directed into the mouth, by having the patient lie on her left side until the wound had healed. The ulcer on the neck quickly healed, and in the course of a few weeks the

space between the ends of the bones was filled in with granulations. The splint held the jaws in position for several months, when it was found that the new tissue had become sufficiently firm to hold the jaw in its original position, and to allow the patient the almost normal use of her jaws. When I reunited the wound in the cheek I dissected away sufficient cellular tissue to reduce the bunch on the side of the face.

Dr. H. W. Gillette, New York City: The contraction of the scarred tissue in the region of the wound is not going to draw the jaw around, is it?

Dr. Curtis: It has not yet drawn it around enough to cause any appreciable change in the occlusion of the teeth.

The President: Do you think it wise to expand the arch as soon as possible?

Dr. Curtis: There is no necessity for expanding the arch, and the molars occlude perfectly. I am inclined to leave the regulating until the permanent teeth appear.

This gentleman has kindly allowed me to demonstrate in his mouth the results of an operation for epithelioma. The primary seat of the disease was in the left cheek near Steno's duct, and the patient thinks the trouble was caused by a broken molar which irritated the cheek. Before my attention was called to the case a small growth had been burned away. This reappeared in the course of a few months. I found a tumor about half the size of a peanut, the base of which was half an inch in diameter. I injected cocain around and resected it. This left an opening of fully one inch, but the wound healed quickly. In about six months the disease recurred, this time including the soft tissue of the maxilla. The growth was then removed by a cauterizing injection applied by the family physician. Three months later the bone was found to be involved, and within a very short time the disease seemed to spring up afresh, involving both the cheek and maxilla. It was decided to make a more extensive operation, so about one-half of the mucous membrane of the cheek and one-half of the superior maxilla were removed. The wound healed rapidly, and in two weeks the patient was able to have an artificial denture to protect the antrum and to facilitate speech. Three months later the growth was again discovered in the cheek at the original seat of the disease, extending into the antrum. At the patient's request I injected into this growth a

fluid prepared by Dr. Alexander of Boston, which the patient had formerly used. All the infiltrated tissue was destroyed and the parts became healthy. At the beginning of the trouble the patient's health was greatly impaired, but under treatment it steadily improved. I should have stated that a microscopical examination showed the first tumor removed by me to be an epithelioma. The prognosis in these cases should be very guarded. I have had satisfactory results in about two-thirds of those treated. The rule is that the disease returns at regular intervals, but thus far this patient has continued well and there are no signs of a return of the trouble.

Both these young women had disease of the antrum. Miss B., whose dentist had treated her for a year and a half, gradually failed in health and blood-poisoning set in. Several of her teeth were abscessed, and the second bicuspid, which was also abscessed, had been extracted, and the treatment of the antrum was through the socket. I operated on this case under cocain, making an opening at the base of the malar and well above the roots of the molars. The object of making an opening at this point (the method of which I demonstrated fifteen years ago) is not only to allow opening into the antrum at the thinnest portion of the bone, and to facilitate curetting, but to prevent the mucous from flowing downward, as happens when the opening is made through the tooth-socket. Treated from this position the mucous membrane quickly recovers its normal function. The antrum was filled with mucous cysts, pus and granulations, and about two-thirds of the mucous membrane had been destroyed. The case progressed rapidly and new membrane quickly formed to cover the denuded area. I had about concluded that the process of healing was complete, when an offensive odor led me to again open the antrum, and I discovered a tumor the size of a small olive far back under the eye. I completely curetted this away and packed and dressed the antrum with gauze as before, continuing the dressing until the membrane was reproduced. Success followed and the patient is in good health to-day.

The chief object in showing this case is to encourage beginners in this work, who should not be discouraged if they are not successful in the first operation. It is safe to state that ninety per cent of these cases are caused by alveolar abscess. It is my custom when the bone has been denuded in whole or in part to thoroughly

roughen it with a sharp curet or bur, trim away the edges of the mucous membrane, even when there is none found except at the edge of the antral orifice, firmly pack with gauze, and change it every few days until inflammatory action is well established and the blood vessels are forming. Hemorrhage is then checked and the antrum packed with aristol, which does not absorb moisture. This supports the blood vessels, which rapidly form to complete a network all around the antrum. Great care must be exercised in removing the aristol, which should be renewed every two weeks until the mucous membrane has formed, which usually requires from four to eight weeks. The antrum is then douched daily until the epithelium is of sufficient strength to carry off the mucus through the natural channel, when the opening into the antrum is allowed to close. My average time for successful treatment of antrum cases is six weeks.

The next case, Miss J., was a complicated one. She came to me in June, 1900, with the following history: Ten years ago she found she was becoming deaf, and since that time she had been under almost constant treatment for her hearing and nasal catarrh. Some time before this she had a right upper molar and bicuspid treated, their pulps having died. The treatment was unsuccessful, however, and both the deafness and the catarrhal conditions increased. At times the right side of her face was swollen. In May, 1900, it became sore and several spots like boils appeared, accompanied by swelling and pain. The case was brought to me early in June, and I diagnosed it as multiple abscess of the cheek, induced by antral disease and fistula from the abscessed teeth. This patient also suffered from blood poisoning and was anemic and tubercular. The abscessed teeth and antrum were first operated on, and by the latter part of July, when I left the city, I had succeeded in establishing a normal condition in the antrum, and in healing all but one of the nine abscesses in the cheek, which was done without opening through the face. I left the patient in the care of her physician, who advised her to go to a hospital to have the treatment continued. The surgeon in charge, who was not familiar with the new method of treatment, insisted upon opening into the antrum, and allowed the abscess to break through onto the face. Upon my return to the city two months later I found the antrum filled with pus, and there was also present a discharging ulcer of the cheek. Furthermore,

there was paralysis of the right side of the face, which was not present when I last saw the patient. As you now see, health has been apparently restored to the parts through my treatment, and with the exception of a small scar on the cheek and a slight paralysis which grows daily less, a normal condition seems to be established. The catarrhal trouble was due to antral disease, the mucous membrane of the antrum being completely destroyed and thrown off and the walls denuded. I had some difficulty in restoring the mucous membrane in this antrum on account of occasional infection from the cheek abscess. The antrum is now being douched every other day, is free from pus, and for the past month has been secreting healthy mucus. The patient's health is nearly restored and her hearing is much improved.

Dr. Gillette: How about the condition of facial paralysis?

Dr. Curtis: The paralysis is very much diminished, being scarcely noticeable. That side of the face has been treated with electricity during the last two months.

FASTENING RETAINING BANDS.

BY GEORGE M. CAMERON, D.D.S., CHICAGO.

There will be very little trouble with retaining bands coming off if the following method is used: Make bands larger than for cap or crown and as wide as possible on lingual side; punch or drill three or four holes through lingual part and counter-sink same on outer surface, leaving inner surface rough. Try on; remove and clean with alcohol; dry thoroughly, and fill with plenty of "Fellowship" cement, well mixed and thin. I formerly applied cotton or absorbent paper around tooth to protect from moisture, but with the "Fellowship" cement this is not necessary. Cleanse tooth with alcohol; dry with chip blower; place band in position, and push to place with napkin; hold for three or four minutes, when the cement will be set. Any surplus can be removed then or at next sitting.

SOLDERING HINT.

BY L. C. TAYLOR, D.D.S., HARTFORD, CONN.

When soldering crowns or bridges requiring a number of pieces of solder, first pickle well in acid so surfaces will be bright, then place solder in quantity about as needed, drop a few drops of sticky wax on it to hold solder in place, put borax over the wax, and heat

up slowly to dry out. Then with blow-pipe bring the mass to a white heat, allowing the wax to burn out, and see how quickly the work will be completed without the solder crawling with borax or dropping from some slight jar of the case. The solder for a full plate can be put in place when plate is cold under the above method with great satisfaction. It has been suggested that the borax would flow with the wax, soak into investment, and crack the porcelain, but I have soldered with this method for more than a year and have never had a porcelain crack. Several friends to whom I have suggested this plan report that they are employing it all the time with gratifying results.

TO REMOVE CONTENTS OF ALVEOLAR ABSCESS.

BY E. L. STEVENS, D.D.S., PARIS, KY.

Many methods have been suggested for the removal of the contents of an alveolar abscess after it has been opened. I make use of the saliva ejector which is attached to my fountain spittoon. First, take out the mouth-piece and insert three or four inches of glass tubing, then take a second piece of tubing, hold it in the flame of a Bunsen burner, bend to an angle of about twenty degrees and draw it until it breaks, which gives a good tapering point. Cut off small end up to hollow part with a file, as you close the tube when drawing. Now connect this piece of glass tubing with the first one with a piece of rubber tubing about two inches long, which forms a joint that you can work in any direction. Insert point of tube in canal if large enough, or if not, into pulp chamber, and fill around it with wax, making it air-tight. Then turn on water, and if there is any matter in the cavity or canal it will be drawn out. If anything does pass out you can see it through the glass tube. A hollow metal needle would probably answer the purpose as well or better than the glass one.

ART IN VULCANITE.

BY G. H. THOMPSON, D.D.S., HONEOYE FALLS, N. Y. READ BEFORE THE ROCHESTER DENTAL SOCIETY, OCT. 8, 1901.

To make a rubber plate requires artistic as well as mechanical skill. There is no doubt that the dentist possessing the latter has a great advantage over the one possessing only the former. He can make a plate that will be mechanically correct and give good service,

even though it appears in the mouth as if made for any one of a dozen different persons, so far as esthetic effect is concerned. When both attainments are combined in one individual, and art and utility go hand in hand, then we have in the finished denture something that will answer for only one person and will be both a source of comfort to the patient and a pleasure to the friends who are obliged to see it from day to day.

We are taught to sacrifice appearance for service, but there are few cases where the rule is necessary. We should endeavor to work into each plate a distinct individuality that will stamp out the false look which brands the majority of artificial sets. The patient of forty requires something different from the one of twenty or sixty.

My plan for reproducing the features is to make articulating models of wax as guides. While preparing them I study the features, the contour of the face and the action of the muscles. The patients can be of great assistance if you explain your methods and plans; they will manifest as much interest as you take and will often call attention to points that might otherwise be overlooked.

A perfect occlusion is just as essential to the esthetic effect as it is to the mechanical use of the denture. I know of no method by which we can obtain this and be absolutely sure it is correct. When building out the articulating models it is a good plan to have the patients open and shut the mouth repeatedly, you watching the place each time, but be very careful not to divulge what you are aiming at, and they will unconsciously close correctly.

Another important item is to select a set of teeth suitable for the age and temperament. Admitting that the gum teeth come nearer to reproducing the color of the natural gum, there are very few of our patients who raise the lip high enough for the gum to be noticeable, and it is next to impossible to follow out Dr. Bonwill's or Dr. Snow's ideas if these teeth are used. By employing plain teeth we can give a distinct individuality to each tooth, besides arranging a denture for mastication which will be as near perfect as anything artificial can be.

Discussion. *J. Requa*, Rochester. The doctor advocates plain teeth and the Bonwill or Snow articulator, which is correct, as a full denture cannot be properly articulated on a straight open and shut articulator, although some dentists still attempt to do it. One artistic touch in a vulcanite plate is to make sure that when finished

it shall contain no more rubber than is actually necessary for sufficient strength and to give proper fullness to the face. The contour is of necessity generally made about right, but in other parts of the plate we frequently see a wrong and useless distribution of rubber. To particularize, immediately back of the incisors the rubber should be barely thick enough for strength, and in finishing that part of the plate the dentist should have in mind the tip of the tongue of the one who is to wear it. Allow as much room and free play as possible, even though the plate at that point be a little weakened thereby. A liberal amount of rubber in the central portion of the arch will supply strength and not be in the way of the tongue or food. On the lingual side of the bicuspid and molars there should be only as much vulcanite as is compatible with strength, in order to give the sides of the tongue plenty of room. This is trite advice, but seems to be needed, judging from some of the dentures I see.

ESSENTIAL OILS; THEIR APPLICATION IN DENTISTRY.

BY DAVID STERN, B.S., D.D.S. READ BEFORE THE CINCINNATI ODONTOLOGICAL SOCIETY, FEBRUARY 28, 1902.

In his paper on putrescent pulps (*DENTAL DIGEST*, June, 1900), Dr. A. H. Peck says: "I would that we could all be first-class chemists, both analytical and synthetic, for then we could subject our medicines to the necessary tests and analyses, to determine whether or not they are best suited to successfully combat the various conditions to which they are being applied." The fact that the action of many drugs, especially of the essential oils, used in dentistry has puzzled all the investigators of these mysterious bodies is probably due to the similarity in chemical construction. The literature on this subject, not very extensive as far as dentistry is concerned, is furnished by a few able men who have written scientifically. I have taken great liberties with the writings of Drs. Black, Peck, Burchard, and Harlan, all of whom have devoted much time and care to the study of the subject of to-night's paper.

Being nearly alike in chemical reactions, the essential oils are distinguished chiefly by their physical properties. They consist mostly of terpenes and their close derivatives and are of the class of hydrocarbons, having the common formula $C_{10}H_{16}$, of which turpentine oil is the most familiar representative. They are disposed

to absorb oxygen from the air and pass into camphors, two atoms of hydrogen being given off for each atom of oxygen taken on. This oxygen, in connection with moisture and heat, is again given off in the nascent state, and it is probable that it is the nascent oxygen which has the antiseptic and disinfecting action, as it chemically destroys septic matter. By "disinfection" I mean the destruction of living germs of disease, that is, disinfection is accomplished by the use of germicides.

In the practice of medicine the essential oils are not considered of practical importance as disinfectants, although experiments have been made with pathogenic bacteria. The results obtained with one—the bacillus of typhoid fever—show the time required by various oils to kill the microbe :

Oil of cinnamon, of Ceylon. 12 minutes.

Oil of cloves. 25 minutes.

Oil of thyme 35 minutes.

Thymol. 35 minutes,

while the oil of turpentine required more than twenty-four hours, and peppermint, eucalyptus, cajeput, wintergreen, and camphor took more than six days.

In dentistry we apply many other disinfectants and antiseptics, such as heat, hydrogen peroxid, permanganate of potash, bichlorid of mercury, etc., but the essential oils are considered of advantage as dressings for pulpless teeth, abscesses, putrescent pulps, etc., being readily applied to the diseased part and left there until the dentist sees the patient again. The important point is, with which of the oils are the best results obtained?

Dr. Burchard states that the essential oils act as protoplasmic poisons, without coagulating albuminous matter. They probably differ in germicidal power, the oil of cassia leading in this respect, the oils of cloves, eugenol ($C_{10}H_{12}O_2$), which is the active principle of oil of cloves, eucalyptus, gaultheria, etc., following in the order mentioned. With the exception of the oil of peppermint, which has a cooling effect, they have a tendency to produce a warm and in some cases a burning sensation when applied in the mouth.

Dr. Peck has given us the results of investigations made in his bacteriological laboratory. To determine the irritating or non-irritating properties of these oils, he made a large number of experiments on his own person and also in connection with sores artifi-

ally produced on guinea pigs. He found that while the oil of cassia stands at the head of the essential oils as a antiseptic and is an excellent germicide when applied to suppurating surfaces, it is most poisonous and irritating in its effects upon soft tissue. On account of these characteristics it is not recommended as a dressing in the root canals of teeth. It also has the tendency to discolor the teeth, and this discoloration is difficult to overcome. There is a difference between the oil of cassia of China and the oil of cinnamon, which is a product of Ceylon. It has been shown that the oil of cinnamon is not so irritating to the soft tissue as the oil of cassia.

The oil of cloves, consisting of caryophyllin ($C_{10}H_{16}$) and the oxygen oil, eugenol, is non-irritating to soft tissue, leaves no discoloration and is effective in destroying microbes. It is therefore recommended for general use in the treating of pulpless teeth.

The oil of eucalyptus possesses more powerful antiseptic properties than phenol (carbolic acid), but it is not so irritating. Faust and Homeyer from the commercial oil obtained sixty per cent terpene ($C_{10}H_{16}$), thirty per cent thymol ($C_{10}H_{14}$) and the remainder an oxygenated compound ($C_{10}H_{16}O$) which they named eucalyptol. On account of its non-irritating qualities it is a splendid agent to place in root canals after the removal of the pulp.

Oil of wintergreen is a subject of disagreement between investigators, one holding that it is an excellent antiseptic, another, that it is useless in restraining the development of bacteria. It is composed principally of methyl salicylate ($CH_3C_7H_5O_2$) and does not belong to the class of terpenes previously mentioned. It is, however, surely a good agent to disguise the taste and odor of other drugs.

There are undoubtedly many others of the essential oils which have curative properties, but those which we have enumerated are the popular ones of dental practice. Although not an essential oil, there is a carbohydrate which is used in treatments as freely as all of the essential oils combined. It is phenol, the so-called carbolic acid, which in a concentrated solution (ninety-five per cent) is a powerful escharotic on soft tissue, and when applied to the dental pulp forms a strong coagulum, but it is not considered an important antiseptic. It is in connection with some of the essential oils that its general popularity exists, and there is no remedy which is more liked by the profession than Black's "1-2-3."

The irritating effect of the cassia seems to be modified by the mildness of the wintergreen, and the coagulating power of the phenol does not appear to be as great in the presence of the cassia and wintergreen. It seems that by the combination of the three in the prescribed proportions a new chemical union is formed which does not possess the properties of the individual factor and is highly satisfactory in the treatment of diseased tissue.

The fact that often the oils do not give the favorable results anticipated may in a measure be due to the adulteration of the drugs. Especially are those from the Orient liberally treated with alcohol and domestic drugs, and few of them will stand an analytical investigation.

Discussion. *Dr. H. A. Smith*, Cincinnati: An antiseptic, if we take carbolic acid as an example, depends upon its soluble action. The essential oils are only slightly soluble, and for this reason they are preferable, because the antiseptic quality lasts longer. The potency of carbolic acid is soon destroyed by dilution. If the oils had perhaps one-half that potency I think they would be equally as good. The most soluble ones are effective for the shortest time.

Dr. J. S. Cassidy, Covington, Ky.: The subject of the essential oils has always been a fascinating one to me because of their complex nature, and because they all contain more or less terpenes. It is well known that these latter become oxidized and give up free oxygen and camphor. These oils also contain other bodies as well as terpenes, and I had thought of criticizing one remark the essayist made, but which he afterwards modified—that terpenes were the active principle of all these oils. From time immemorial oil of cloves has been a domestic antidote for toothache, the wise old women realizing it just as we do, without the science. Years ago Dr. Hunter stated that all a dentist needed was arsenic and carbolic acid, a pound of one and a barrel of the other. If I were limited to the use of one of these oils I should select oil of cloves. The terpenes of these oils when oxidizing change their colors, darkening them, especially oil of cassia. Oil of cloves turns dark yellow, which action is due to a camphor, sometimes called a resinous matter, that is soluble in water. When I find the teeth discolored by this camphor I remove the stains with alcohol. I agree with Dr. Smith that carbolic acid is a poor antiseptic, losing its identity by solution in water. I have always felt that the health-giving

quality of the atmosphere in the pine forests of Kentucky, North Carolina and elsewhere was due to the setting free of the essential oils distilled by nature from these trees.

Dr. Smith: I would ask if the odor given off by the oils while oxidizing is antiseptic or beneficial in any sense?

Dr. Cassidy: The odors that come from bodies like musk bring to us part of the musk itself. If the odor comes from oil of cloves, it is still the oil containing the active principles of the terpenes and the eugenic acid, but that portion of the oil which develops into a resin of course prevents the bacteria from acting on the part affected. Oils which develop into acids, like oil of cassia, are more irritating to tissue than those containing alcohol. Dr. Peck has been very enthusiastic in investigating along these lines. When formaldehyd was brought out he applied a cloth saturated with it to his leg, so as to note the effect. Ulceration set in, and he was a very sick man for three weeks, no remedy that he tried being effective. Finally he applied pure oil of cloves, and the sore healed in a few days.

Dr. A. G. Rose, Cincinnati: Is it true that chloro-percha will follow oil of eucalyptus?

Dr. O. N. Heise, Cincinnati: I have always advocated the use of essential oils in the treatment of pulpless teeth and putrescent pulps, but the idea that you do not want to use anything which coagulates is a mistake, as a coagulant at times is necessary to give nature a chance to forget herself, so to speak.

Dr. Stern: In replying to Dr. Rose, gutta-percha is soluble in oil of eucalyptus. Replying to Dr. Heise, coagulation is oftentimes needed, and I have no idea of depreciating the use of carbolic acid. The greatest difficulty in making these experiments is the fact that we cannot always secure pure chemicals.

RULES FOR WELL REGULATED DENTAL SOCIETIES.

BY S. H. VOYLES, D.D.S., ST. LOUIS.

When you are elected president of a dental society, after many secret deals and a public candidacy of several years, come out strong in your inaugural address that the office came unsought, and advise all the outsiders to drop animosities and work for the good of the society. This reads well and makes people think there may be something in you after all. It also lets the bosses know that you are to be trusted.

* All young members are to be encouraged—to pay their dues. If a young man shows a disposition to take an active interest in society work, appoint him on a committee to raise “steen” hundred dollars for a library. This will consume his energies, and in three months he will be too subdued to be further in the way.

If a young man in any manner intimates that the honors are rotated within a sacred circle, he is a “knocker,” and his further utterances should be attended to by the boss in his most ferocious and effective way.

If there are several young men who are subject to delusions and who threaten to act in concert, call a special meeting at the boss’ office, and amend the by-laws so that a member shall not be eligible for secretary until he has paid dues five consecutive years, and can’t be president until he has been in good standing thirteen years. This will encourage the growth of the society and make it a power in the land. Furthermore, by the time those upstarts get control you may be dead and won’t care.

After you have held all the honors possible for many years, and have been deposed—start a new society. You will of course be elected president. It may live only a year, but what do you care?

Always be IT or start trouble.

When possible it is well to belong to both a state and local society, as you can then swap influence in one for influence in the other—to your advantage, of course.

Most people are timid—the more noise you make the more competitors for society honors will be scared off.

If the office which you hold permits a badge, hang it in your operating room. Your patients will wonder if you are a member of a German band, and this will give you an opportunity to explain the honor that is yours.

It is also a good plan to have your official status—present and ex—printed on your letter and bill-heads, some even advise it on your envelopes. This shows to your patients the high standing of the dental profession—through being served by such prominent men as you.

If you have ever been associated with a man eminent in the profession, keep your head shut until he is dead, and for three years after—to be sure he is good and dead. Then write up all his methods and present them to the society as your own. If anyone

catches on he will be too polite to you to call you down in public. When you are president of a society always have the newspaper reporters attend the meeting. The public is much interested in and reporters are paid to record the fact that the meeting was presided over by the president, Dr. S. U. Reiamit, and that Dr. H. I. Caloric read a paper advocating the use of hot air as a specific in the treatment of pyorrhea alveolaris.

It is rumored that if your society papers are typewritten, and put on one side of each sheet only, they are more likely to be published by the editors of the dental journals.

It is also an advantage to live on or near the Atlantic coast. Editors and manufacturers—dental—have strabismus, they can't see a western man without strong glasses--tumblers preferred.

ARTERIO-SCLEROSIS IN PYORRHEA ALVEOLARIS.

BY FRANK L. SIBLEY, D.D.S., ROCHESTER, N. Y. READ BEFORE THE ROCHESTER DENTAL SOCIETY, FEB. 11, 1902.

Some years ago Dr. C. N. Peirce advanced the theory that pyorrhea was due to the gouty diathesis, and since that time the profession has been questioning as to its correctness, little if any scientific work having been done along the line of original investigation. Writers upon this subject may be divided into three classes: Those who claim it is a local condition; others, that it is constitutional, the middle ground being occupied by the remainder.

To save time I would take my stand with the last-named class. Let us take the theory of Dr. Peirce, that pyorrhea is a local manifestation of lithemia, accepting it as the most reasonable solution of the question that has been advanced. If we apply it clinically, the result will be that many patients who come to us with well developed pyorrhea give no history of lithemia, either in themselves or family, and if you examine the calculus on the roots of the teeth, you will find no trace of uric acid or any of its oxidations. To the humble follower of the faith this is not comforting, and I have heard faith defined as believing in something that is not true.

While it would amount to presumption on my part to defend so eminent and scholarly a gentleman as Dr. Peirce, whose long experience and ripe judgment should win for his conclusions at least thoughtful and studious consideration, at the same time I am glad to take my stand under his banner and fight manfully for the

cause, if I may be permitted to qualify it, or explain how, in my opinion, uric acid acts in originating the diverse pathological conditions ascribed to it: First, in the chemico-mechanical way, or its direct or local effect in setting up irritable and inflammatory states of the tissues. Second, as a toxin, acting indirectly through the nervous system, giving us a line of neuroses, functional in their incipency, but often with resultant changes in structural integrity.

That an excess of uric acid in the system acts as a direct irritant to the nervous system, especially the sympathetic in its vaso-motor fibers, seems to be clearly shown by the apparently incontrovertible provings of Haig as to the effect of an accumulation of uric acid upon circulation. Let us draw upon our own observation for illustrations of the diversified and often diametrically opposite variations of function in the two great organs we are considering, under different conditions of innervation through a common channel—the vasomotor portion of the sympathetic. The hot blush on the cheek of modesty, the ashen pallor on the face of fear, beads of perspiration upon the brow of responsibility, the parched breath upon the lip of embarrassment, are but passing shadows of the fitful play of vaso-motor innervation.

What is true of the vascular condition of a part under disturbed innervation, is equally true of structural changes that may follow—seemingly opposite conditions resulting from common cause. It is my belief that to this extent lithemia is a factor in the etiology of pyorrhea. I do not think the ground we have usually taken is tenable—that uric acid is precipitated upon the roots of the teeth by a kind of osmosis from the blood, there becoming an irritant causing absorption of the process and recession of the gum; but as a chemico-mechanical irritant or a toxin in the blood, bringing about changes in the capillaries which we term arterio-sclerosis or hardening of the coats of the arteries.

We can readily understand that if the capillaries of the blood supply to the teeth become affected in this way there is but one result possible—lack of nourishment to those organs and their ultimate loss. We have all had the experience of seeing well-developed pyorrhea in subjects that give no history of lithemia in themselves or family. One may examine the calculus found on the roots of the teeth and find no trace of uric acid or any of its oxidations.

Now, if we inquire into the etiology of capillary sclerosis we may

find it easier of solution. The cause of this condition may be considered under the headings of heredity, age, sex, alcohol, syphilis, gout, rheumatism, certain acute infections, high living and hard work. In Professor Osler's terse English, the onset may be said to depend in the first place upon the quality of arterial tissue which the individual has inherited; and secondly, upon the wear and tear to which he has subjected it. Age is a very indefinite expression; that a man is as old as his arteries may be a trite saying, but it is true. It is failing arterial nutrition that produces advancing age and cuts off most men's chances of reaching a century of existence.

Habits largely influence the production of arterial sclerosis, however, and give to lives of self-denial or self-indulgence their corresponding reward of longevity or punishment of short life. Of course, the gross alteration of atheroma is undoubtedly a disease chiefly of middle and advanced life; but the finer changes of arterial sclerosis may be determined much sooner in childhood or early youth. In fact, there is no doubt that individuals are born differing in thickness and strength of arterial walls, as much as in the structure of other organs. Since men are more frequently affected with alcoholism, syphilis, gout, and subject to more mental and physical strain than women, it follows that the preponderance of cases occur in the male sex. Alcohol acts in many ways to bring about arterial degeneration; first, it overexcites the heart so that the vessels are subjected to greater strain; second, it disturbs digestion, causes liver cirrhosis and kidney insufficiency, which load the blood with poisons.

Syphilis causes so much thickening of the inner walls of the vessels as to lead to great diminution or final obliteration of their caliber. It also attacks the brain vessels by preference, because syphilitic arteritis is localized in arteries supplied with lymphatic sheaves. Certain acute, infectious diseases, especially typhoid fever, malaria, influenza, scarlet fever and diphtheria may lead to arterial sclerosis, either by injuring the vasomotor nerves and thus leading to changes in the vessel walls, or by directly affecting the endothelium by their specific microorganisms or toxins. Chronic diseases like gout, rheumatism and diabetes, are frequently attended by arterial sclerosis. Toxins like ergot and lead produce protracted, spasmodic contraction of the small vessels. Overfeeding and drinking not only produce simple plethora of the vessels, but in addition

load the blood with toxins, especially in high livers of sedentary habits. Yet, as an initiative, there must be peripheral obstruction to produce hypertrophy of the heart; for Strassberg geese may be stuffed to repletion to supply the market with *foie de gras*, or young porkers fattened for the butcher, without producing cardiac enlargement.

Hard work acts by arising the blood pressure, subjecting the heart to hypertrophy and the vessels to strain. This is especially true if the work be accompanied by depressing psychical emotions, or accomplished under circumstances of prolonged mental and physical strain. To appreciate properly the importance of arterial sclerosis we must begin by divesting ourselves of the idea that the blood-vessels are mere tubes for the conduction of the blood; they are not mere appendages of the heart, but the heart is rather an appendix to the blood-vessels; for low in the scale of life the circulation is carried on without the heart. The study of the blood-vessels is the study of the ultimate processes of life, for not only have they the mechanical functions of contraction and dilation, but they have also the living functions of oxygenation, nutrition, and all of that wonderful and little understood group of changes which are classified as metabolism. Nature as yet works here in her secret laboratory, and we must be content with the study of changes visible to the eye.

FIRST THERMOMETER.—The first sealed thermometer was made some time prior to 1654 by Ferdinand the Second, Grand Duke of Tuscany; he filled the bulb and part of the tube with alcohol, and then sealed the tube by melting the glass tip. There appears to be considerable doubt as to who first employed mercury as the thermometric liquid; the Academia del Cimento used such an instrument in 1657, and it was known in Paris in 1659. Fahrenheit, however, appears to have been the first to construct, in 1714, mercury thermometers having trustworthy scales. The use of the boiling point of water was suggested by Carlo Renaldini in 1694.—*The Engineer*.

TEETOTALERS BORN, NOT MADE.—Dr. Archdall Reid, one of the leading scientists and evolutionists of England, has just published "A Study in Heredity," in which he says, "teetotalers are born, not made." The author states that temperance is not an acquired moral virtue, but an inborn characteristic. He says: "The teetotaler abstains not because of his strong moral fiber, his power of self-control, but because of lack of inborn desire for alcohol." Dr. Reid claims that our well meant temperance efforts must continue to fail to attain the desired end so long as we permit inebriates to beget offspring and to hand down the inborn alcoholic diathesis.

Digests.

PORCELAIN FILLINGS. By R. Ottolengui, M.D.S.. New York. Viewing porcelain from the practical standpoint, where, when, and how shall we use it? Perhaps its chief attractiveness will always be its resemblance to tooth substance, but I would call your attention to other important virtues, two in particular: First, it is a poor conductor of heat; second, it is made out of the mouth and inserted complete. Either of these, and especially both combined, will in many instances elect porcelain to a precedence over all other materials.

Let me speak of it first from the aspect of its poor conductivity. While modern practice preaches that the dental pulp is often better out of than left in a tooth, this very dogma has arisen from the fact that a metallic filling in close proximity to the dental pulp endangers the vitality of that organ. It is because of the constant death of pulps under large gold or amalgam fillings, with consequent abscesses, that we have come to see that in many instances, considering the perfection of antiseptic treatment to-day, it is a safer and wiser proceeding to remove the pulp prior to inserting the filling, rather than to risk its sudden death and the infection of the apical regions. This is undoubtedly sound doctrine, but it is applicable only in proportion to the age of the patient. That is to say, the younger the patient the less excuse have we for intentionally devitalizing a pulp. In view of this self-evident fact even the most radical destroyers of pulps bend every energy towards the conservation of the pulp in young teeth, and to this end they pin their reliance to temporizing with plastics. Here, then, we arrive at a point where even the American dentist discards gold and utilizes a material which is perishable in the environment. Here, then, we find a class of cases where porcelain must appeal to us, not because of its beauty, but because it is more permanent and more conservative of the health of the tooth than any other material.

Coming to the second advantage, the fact that the filling is made out of the mouth and inserted quickly and in one piece, we find that once more it appeals to us in exactly those places where we reluctantly discard gold. That is, there are many localities where, because of the time required for a gold filling, it would be impossible

to maintain dryness of the cavity sufficiently long to permit us to insert a perfect filling. Many such cases will occur to your minds, so that I need mention but a few. Some of the most beautiful fillings that I have seen made by Dr. Jenkins have been along the gum margins on the buccal surfaces of lower molars, the fillings being half under the gum. We all have had the experience that even after the use of gutta-percha or other packing to push away the gum, we have met such a flow of saliva as to preclude the successful use of gold, so that we have been compelled to rely upon amalgam. Here it is the very best practice to use porcelain, and yet it is a situation where the beauty of the work is absolutely unimportant. In true American fashion we choose it because it is the most durable and the most useful material.

Another difficult position is where the improper use of clasps has resulted in abrasion and subsequent caries about the necks of molars, usually extending below the gum and commonly very sensitive to the touch. Amalgam is the common reliance, and too often the electro-chemical action caused by the contact of the gold clasp with the amalgam filling leads either to reappearance of caries or death of the pulp. Here is a place where porcelain is useful, both because it is a non-conductor and because it is made in a single piece and may be quickly inserted, requiring a minimum period of dryness. I show a specimen of this class of work where it will be noted that the cavity has been cut entirely below the line of enamel, a fact which would almost always preclude the successful use of gold, whereas it does not greatly hinder the utilization of porcelain.

Gum Colored Porcelain.—A somewhat similar position, where however we may also take advantage of the artistic appearance of porcelain, is shown in another specimen where the filling is made entirely of pink porcelain. Often in mouths where there may be no recession along the palatal side of the teeth we find extensive recession of the gums along the labial aspect of the cuspids. The exposed roots become very sensitive, and perhaps for this reason proper brushing is not accomplished, with the result that caries sets in, extending under the free margin of the gum to a considerable distance. Here we frequently find great difficulty in using a clamp, so much so that very many ingenious devices have been invented to aid us, yet with half a dozen in our cabinet we too often meet cases where the rubber-dam seems inhibited. But even where we succeed

and place a gold filling, it is a large glaring display of gold, carrying constant menace to the pulp which it so closely overlies. The use of gutta-percha for a day or two will push away the gum sufficiently that a perfect matrix may be made, showing all the outline of the cavity edge with absolute accuracy; and much more quickly and certainly with less pain to the patient a porcelain filling may be made, which, constructed of the gum-colored porcelain, absolutely defies detection and restores the tooth apparently to its original size and shape.

High Versus Low-Fusing Porcelain.—Advancing now to the extreme possibilities of porcelain, I must touch for a moment upon the controversy between the advocates of high and low-fusing bodies. I believe there is a general feeling throughout the country that the high fusing is the more reliable. This has come about by the constant repetitions of a few writers favoring high-fusing bodies, while the more conservative experimenters with the low-fusing materials have felt it best to devote their time to mastering the many intricacies of technique, satisfied that their confidence in Dr. Jenkins' material would sooner or later manifest itself beyond cavil. While I believe that the Jenkins body is the best for practical purposes, I must in common honesty admit that I have not used any of the other higher-fusing materials. Consequently my deductions must be considered with due relation to the fact that I discuss high-fusing porcelain only from the claims and exhibited work of its advocates, and not from practical experience. I have, however, endeavored to make matrices with platinum, some being in one instance furnished to me by Dr. Head, from which I may argue that I have experimented with the proper kind of platinum. In my hands, at least, the platinum matrix limits the use of porcelain. Remembering that after all there must be some space between the filling and the tooth because of the necessary presence of cement, we must admit as an honest basis of argument that many cavities can be as easily managed with platinum as with gold foil. But I think the fact cannot be disputed, that in proportion as the size and depth of the cavity increases the platinum becomes less and less a possibility. This, if true, entirely discounts the high-fusing method, for the only advantage that even its most ardent admirers make for high-fusing material is that it is stronger, which, however, is not true. But for a moment admitting this, we must allow that in pro-

portion as the porcelain is exposed to the stress of mastication the demand for strength increases; yet it is exactly in compound cavities that the platinum matrix becomes increasingly inaccurate in relation to the extent and depth of the cavity.

Large Contour Fillings in Molar Teeth.—When Dr. Jenkins was last in this country I endeavored to persuade Dr. Head, or any other high-fusing-body advocate to make a filling for the same cavity as that for which Dr. Jenkins would make one, and I had in mind one so extensive that I doubted whether the test could be met with a method relying upon platinum for a matrix. I failed to get the clinicians to agree upon such a test, and at that time did not feel sufficiently skillful myself to risk the condemnation or seeming failure of the Jenkins body, which might result from my own lack of ability. For this occasion, however, I have made a large contour filling as a specimen of what even I, with my limited experience, can accomplish with the Jenkins body. To those who have not tried it I wish to state that I find it more difficult to get a perfect result working with a dried tooth out of the mouth than when working on living teeth. It seems impossible to prepare the cavity margins as perfectly as when operating upon living tissue.

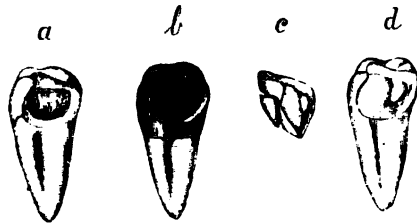


Fig. 1.

In the specimen now shown (Fig. 1) I have endeavored to reproduce a case from actual practice, one which combines every useful characteristic of porcelain. In the illustration *a* shows the cavity; *b* the extent to which the matrix is made to overlap the edges, thus affording a guide in contouring; *c* is the filling with undercut groove for retention, and *d* the filling in the tooth, showing restoration.

In the dried specimen the pulp chamber has been encroached upon, but that was an accident, which, however, only increases the value of the test by deepening the cavity, for it dissipates the argument that the shrinkage of the Jenkins body distorts the shape of

the matrix. In the practical case the patient was a Miss of ten who presented with the disto-lingual section of a first molar lost, and caries extending below the gum at the distal aspect, the pulp being closely approached but not exposed. I will ask those who examine the specimen to decide for themselves the chance of success with a gold filling of that magnitude, in the moist mouth of a nervous, irritable girl of tender age. Yet a filling in every way as perfect as the specimen shown was made and inserted, the gum having been first pressed away by temporary fillings of gutta-percha, and the tooth kept dry long enough for placing the filling by using cotton rolls, with a combination clamp which depresses the tongue besides holding the cotton roll in place. The saliva ejector, of course, also assisted. In examining the specimen shown I will ask the gentlemen to observe the accuracy of the marginal adaptation, and to turn the tooth in the fingers to view the contouring from every aspect, as well as the restoration of knuckle, which was, of course, not an essential feature in this instance, where the second molar had not as yet erupted.

Having touched upon the word knuckling, I may pause a moment to reply to the queries which may have been aroused in the minds of some. The accurate restoration of contour so as to produce contact is largely a matter of skill and comes with experience. Here, however, the gold matrix is more helpful than the platinum, because the gold can be made to cover so great a surface of the tooth beyond the cavity margins (Fig. 1 b) that we have not merely an impression of the cavity, as when using platinum, but in effect an impression of the whole tooth with a cavity in it. This gives us the lines that fairly indicate the restoration required. It is good practice to overbuild a little and then obtain space by separation, to permit placing the filling. This assures contact when the teeth resume their normal places.

Durability of Jenkins' Porcelain.—Before passing from the availability of porcelain I must say a word in regard to the comparative durability of the Jenkins material. That which is at present offered is an improvement both in color and strength over what was first placed on the market. The present product in my hands not only gives great satisfaction, but seems to have extraordinary strength, even thin edges being surprisingly resistant to stress. As an explanation of my meaning, formerly I found that

if by chance the material had been permitted to extend beyond the margin of the cavity, as indicated in the matrix, the feather edge resulting was quite brittle, and would shatter if brought into contact with a paper disk. Now I find that even very thin edges of this character may be ground away with a fine cuttlefish disk without breaking, thus allowing reduction to the original edge and polishing of the same. I also find that after setting a filling, should it seem requisite, the margins may be polished with strips as safely as where metallic fillings are similarly treated. The Jenkins porcelain will scratch glass, which I think a good evidence of its density.

Method of Construction.—I pass now to a brief consideration of the construction of the porcelain filling, and here I call attention to the fact that, as an advocate of the Jenkins method, I speak of porcelain *fillings*, whereas the high-fusing men speak of porcelain *inlays*. I think this significant, as inlays are presumably more shallow than fillings, and act more as a veneer than as a true filling. It has seemed requisite to all porcelain workers, so far as I have seen recorded in their writings, that the aperture of a cavity should be larger than what we may term the interior arrangement thereof. This conclusion has been reached empirically from the fact that it is needful to be able to remove the matrix without alteration of shape, and finally to insert the filling whole rather than in particles as we do gold or a plastic. A necessary result has been that the sole reliance for retention has been upon the so-called cements. The failures with porcelain have been almost exclusively due to the failure of the cement. Curiously enough, it has been found that whereas the cement adheres to the cavity walls, whatever their shape, this is not true in relation to the porcelain, the filling coming away clean. Consequently the need of roughening the under surface of the filling was early discovered, but even this in many instances was an inadequate reliance. Having the advantage of observing Dr. Jenkins at work, I noted the manner in which, with diamond-copper disks he cut grooves in the porcelain, and I saw at once the advantage of his method, as well as the fact that it had never been adequately explained in print. At the next public discussion of this subject I therefore ventured to describe it as a continuous groove which results in forming upon the under side of the filling a shape similar to the head and neck of a collar-button.

(Fig. 1 c.) Since preparing porcelain fillings in this manner I have not lost one. Nevertheless, I have long felt that a totally different cavity preparation was a great desideratum in this work, if true permanency were to be achieved.

New Cavity Preparation for Porcelain.—I take the liberty of hoping that I have solved this problem. I believe I have found a simple yet effective cavity preparation, whereby the porcelain inlay will be mechanically retained, as is a gold filling, the cement being utilized merely to seal it into position and only in a measure acting to retain it. I therefore take pleasure in exhibiting to-night the result of my experiment. The specimen shown is an extreme example, chosen because working with dried teeth I can better show the cavity formation in a large cavity than in a small one, and also because in this way I once more show the possibilities of filling exceedingly deep cavities with the Jenkins body. (Fig. 2 *a*, cavity showing countersunk V-shaped groove; *b*, the matrix in the cavity; *c*, the filling in place.)

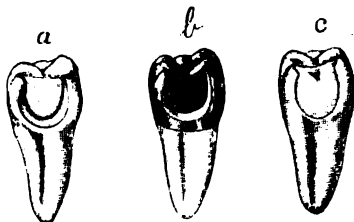


Fig. 2.

The new cavity formation which I suggest to porcelain workers may be likened in homely phrase to the sliding cover to a wooden box. The principle is the same, but it differs from the box cover in that the groove in which the filling slides to place must not have paralleled sides, but on the contrary, should be approximately V-shaped, with the widest divergence toward the entrance of the cavity. This style of cavity preparation will be particularly applicable to compound cavities which reach the masticating surfaces, as the mechanical arrangement will materially resist the stress of mastication, thus reducing the strain against the cement to absolutely nothing, the filling being so placed that even without cement it could not be displaced by normal stress (though of course in the upper jaw gravity would dislodge it.) This cavity formation may

also be advantageously used in approximal cavities, the filling sliding in either from the labial, buccal or palatal surfaces, as indicated by the requirements. A great advantage in approximal situations is that with this shape of cavity the need of very great separation is avoided.

Extreme care, however, will be needed in making the matrix, and especially in removing it, and I advise that if in removal a close scrutiny detects a slight alteration, either the overhanging portion of the gold which hindered its free withdrawal must be cut off with scissors, or else the divergence of the cavity margins and the sliding grooves must be altered to facilitate what, in moulder's phrase, would be called "the draw." After such alteration either in the cavity or in the matrix by trimming, the matrix should be returned to the cavity and readjusted. This should be repeated till a perfect matrix is removed without alteration in shape.

Removing the Matrix.—I will offer another little suggestion which has recently given me considerable satisfaction. The matrix, as we have been repeatedly told, must be "teased" out of the cavity. I find that this may be greatly facilitated by using an explorer point on the end of which is placed a tiny piece of separating or wedge rubber, the pure gum affording just enough friction to start the matrix, without tending to alter its shape. In large cavities, a small ball burnisher over which is stretched a bit of the smallest French rubber tubing serves the same purpose.—*Items, April, 1902.*

* * *

INFLUENCE OF SEXUALITY IN THE DEVELOPMENT OF THE TEETH. By T. Elhanan Powell, D.D.S., Chicago. Read before Chicago Odontographic Society. In the study of comparative anatomy one is wonderfully impressed with the apparently close relation existing between the development of the teeth and the sexual instinct. Throughout all nature the male of almost every species has some special organ which makes it more formidable in battle than the female, or else is endowed with some feature of beauty which enables it to compete with the other males for the favor of the females. Darwin, in his "Origin of Species," tells us of the battles between alligators for the possession of the females, how they bellow and whirl around while fighting. We have also been told how the males of certain hymenopterous insects have been seen to fight for a particular female, who sits by, a nonpartisan beholder, and allows herself to be escorted away by the victor.

Battle is the prevailing method for winning the favor of the female among most of the mammals, and those not endowed with horns are almost invariably possessed of enormously developed tusks, which are used for offense and defense; even those animals which we look upon as not being in the least obstreperous engage in desperate conflict during the season of love; male hares, moles and squirrels, which are not ordinarily pugnacious, wound each other severely at such seasons. Richardson tells us of the skeletons of stags having been found with horns tightly locked together.

The males of the carnivora are not endowed with special fighting tools on account of the extreme specialization of the teeth. The felidae, the canidae, and ursidae are all specially endowed with formidable teeth and claws which are used both to procure food for themselves and for weapons of offense and defense.

In the male norwhal the left incisor appears to be the sexual weapon, as it grows in length sometimes nine and ten feet, and is entirely absent in the female. Darwin tells us that "with many animals the cuspid teeth in the upper or lower jaw, or in both, are much larger in the males than in the females, or are absent entirely in the latter, with the exception sometimes of a hidden rudiment. Certain antelope, the musk deer, camel, horse, boar, various apes, seals and walrus offer instances."

The ornithorynchus, a species of mole, belonging to the lowest order of mammalia, has a curious feature, consisting of a spur on the foreleg, resembling somewhat the poison fang of a serpent, but not having a poisonous secretion, and on the leg of the female there is a hollow into which the spur of the male appears to fit.

The marsupialia is a low order of mammalia, depending on swiftness of flight for protection, and the young are carried in the marsupial pouch in front of the abdomen. Thus the mother protects her young. There appears to be no special development of the teeth on account of sex in this order, as they are utterly devoid of cuspids, except the American opossum, the dasyure and wombat of Australia. The dasyure have well developed cuspids, and are much more fierce in combat than any of the rest of the marsupials.

The prominent exceptions to excessive cuspid development among the mammalia is the norwhal, already mentioned, the kangaroo, the beaver and the elephant; all these have an unusual development of the central incisors. These teeth in the norwhal and the elephant

appear to be cuspidal, but are developed from the intermaxillary bones, and are consequently true incisors. In the beavers, which appear to be the most highly intellectual of all the lower animals, the incisors are specially adapted to cutting down trees, which they use in building their houses. I might mention, in passing, that the beaver is the original pioneer. House-building with him is a regular vocation born of the necessity for continual gnawing. His teeth grow from persistent pulps, and were he to cease gnawing his life would pay the forfeit, as the teeth through disuse would curve around so as to prevent the animal from obtaining food, and he would soon starve to death.

The lower incisors of the kangaroo are shaped like a pair of shears, and are used for shearing grass. The two halves of the lower jaw are separate and movable horizontally, one incisor in each jaw. In the order of the ruminants the cuspids are nearly always absent wherever horns are present. The upper incisors are also usually absent in this order when the horns are present, or vice versa. And there is always greater development of the horns of the stag than of the female.

The wild boar is an excellent example of the influence of the sexual organs on the teeth. There is no male animal which has a greater opportunity to indulge the sexual nature than the wild pig, and the tusks become enormously developed. This same species shows none of this unusual development when castration has taken place early and the cuspids of the female are of ordinary size.

The cuspids of the horse are larger in the male than in the female unless castration is performed early, and not only are they larger, but there is an enormous development of the neck and mane. The unusual neck development is also noticed in the male of the common cow. The rhinoceros has no cuspids, but has six incisors, and they bear an inverse relationship to the absence or presence of horns.

In the higher order of mammalia, including all of the primates, we begin to notice the influence of intellect on specially organized features; as the scale of intellect is ascended less and less use is found for organs which serve the purpose of battle in the lower orders. The development of the cuspids is in inverse relationship to the orthognathism. The lemurs have almost a horizontal facial angle, and next to the lemurs is the old world baboon. Then comes the new world monkey, which has a facial angle of 45 degrees with a very small cuspidal development.

Man has a facial angle of above 75 degrees, and the difference in the development of the cuspids between the sexes is nil. Endowed with the intelligence to utilize nature and art, with all the culture of civilization to assist him, nature has avoided any unnecessary work on the cuspids, but has left on the face of the sensual her unmistakable mark, i. e., a coarse and heavy development of the lower face at the expense of the intellectual faculties.

With all the intellect of man, I doubt if it can be proven that he possesses superior moral fiber to many of the lower animals. It is true that nearly all the male mammals fight for the favor of the females, yet there is exercised a chastity and a discretion far beyond that of any civilized race.

From the lemur to civilized man there is a gradual reduction of the prognathism and a corresponding development of that portion of the nervous tissue contained in the cranial cavity. Man's is the nervous system par excellence, but this nervous development is at the expense of the physical, and when carried to the extremes of luxurious civilization the moral also becomes perverted. The Indian with all of his savagery and ferociousness of nature is more moral sexually than the most civilized nations of Europe. The explanation for this lies in the difference in the amount of effort necessary to sustain life. The savage's life is a strenuous one, and he is compelled to use all the physical effort he is capable of to wring from nature that which means life to him. On the other hand, wealth with all of its enervating influences saps the physical and moral life of modern Europe, and is beginning to claim its victims in America.

The typical mammalian formula is forty-four teeth, while civilized man has but thirty-two. We sometimes notice a reversion to the original type in the form of supernumeraries which we look upon as abnormalities. In the lower tribes found in Australia and Africa it is not at all unusual for fourth molars to be found in place. Their teeth are much larger than those of civilized man, and much better formed. The third and fourth molars are as large or larger than the first and second. They have a decided prognathism, and the head is small, with thick, dense, cranial bones. The cuspid teeth are large and prominent, which is more noticeable in the males than it is in the females. The sexual nature of lower forms of man is very strong, the difference consisting in the rareness of sterility

and the universally strong and healthy offspring. Where food can be readily obtained, the death rate among the children is very low, uterine troubles are practically unknown and child-birth merely an incident. In civilized man the highly developed nervous system leads to moral perversions of every description, and among women diseases of the procreative organs are so universal that to find a perfectly well woman is something remarkable.

All nature gives evidence of a close relationship between the sexual nature and the teeth, and when it ceases to influence their development, retrogression and degeneration, both moral and physical, have set in. To quote Darwin: "If we look back to an extremely remote epoch, before man had arrived at the dignity of manhood, had he been guided more by instinct and less by reason than are the lowest savages of the present time, our earliest ancestors would not have practiced infanticide or polyandry; for the instincts of the lower animals are never so perverted as to lead them regularly to destroy their own offspring, nor put a check on the increase of population by the practice of licentiousness."

Why the sexual nature influences the development of the teeth is a problem which has never as yet been answered. No one has been able to explain why a stag never renews his horns after castration, but it is evidenced by many naturalists that he does not. The stag of the reindeer seems to be an exception, it being claimed that the horns of the reindeer are not sexually affected. There must be a close relationship through the sympathetic nerve. The sympathetic nerve is composed of a series of ganglia forming two cords, one on either side of the spine, connecting the ganglion of Ribes on the anterior cerebral communicating artery with the ganglion impar situated in front of the coccyx. The gasserian ganglion on the root of the fifth pair of nerves affects pretty much all the frontal portion of the head, and by pressing the finger on the ganglion impar in front of the coccyx sympathetic sensations can be distributed directly to the superior maxillary and to the teeth. I have heard that irritation of the clitoris affects the incisors and cuspids of the lower jaw. Although the ganglia of Ribes is difficult of access, in some cases pressure put over the ganglion will send sensations down the length of spine. These ganglia communicating with the cerebro-spinal nerves make a network of influence beyond the province of the novice to trace.—*Review, March, 1902.*

AN IDEAL BICUSPID CROWN. By Richard L. Simpson, D.D.S., Fincastle, Va. Much has been written in the journals of late about there being no ideal bicuspid crown. Porcelain "cup" crowns, as well as ordinary porcelain, have been advocated by workers in this material because they most nearly approach the ideal, i. e., having no display of gold at the buccal or grinding surface and at the same time being strong enough to withstand the stress of mastication.

The bicuspid here described is more easily made than a porcelain one, and fulfills the three requirements demanded of it. The root is prepared as for an ordinary Richmond crown; the band made, festooned, fitted, and ground off to be under the gum at the buccal

FIG. 1.

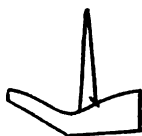


FIG. 2.

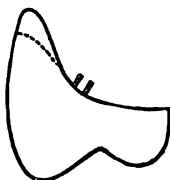
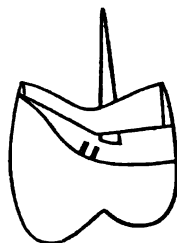


FIG. 3.



surface, but rather wide at the palatal (Fig. 1). Solder the floor to the band with 22-karat solder, leaving a slight projection of the floor like the brim on a straw hat. Trim the mesial and distal parts of the cap so it will pass the approximate teeth to its position on the root; solder the pin to the cap, and then fill in with 20-karat solder the angle formed by the band and projection of the floor. Replace on the root and take the bite and impression.

After mounting on articulator, select a suitable *saddleback* plate tooth, making sure that its palato-buccal dimension is long enough; grind to dotted line of Fig. 2, to its proper position; back it with 24-karat gold; place it on cap; invest and fill the V-shaped space with 18-karat solder, letting the solder melt by heating the investment from the bottom. The diagram of the cross section (Fig. 3) is an explanation in itself.

The reasons for reinforcing the band should be only too evident, as the ordinary band never restores as much tooth as has been cut away, and in case the gold should happen to show, its appearance is that of a gold filling. (Who ever saw an ordinary band look

like a gold filling?) The buccal curve of the crown is continuous from the edge of the band to the edge of the porcelain cusp. The solder at the palatal part of the band does not run off in the final soldering, being prevented by floor of cap. A saddleback tooth almost never breaks in soldering, and its strength when so used is beyond question. A crown so made is a thing of beauty, and will satisfy the most esthetic, to say nothing of patient.—*Cosmos, April, 1902.*

* * *

DEOPATHIC CHRISTOPATHIC PARANOIAC PRAYER.

Under the above caption the *Alienist and Neurologist* quotes from some publication of the "Christian Science" cult the following prayer for a dyspeptic uttered by one of the leading lights of that peculiar order. Gastroenterologists may find in it some food for thought:

"Holy Reality! We believe in Thee that Thou art everywhere present. We really believe it. Blessed Reality, we do not pretend to believe, think we believe, believe that we believe—we believe. Believing that Thou art everywhere present, we believe that Thou art in this patient's stomach, in every fiber, in every cell, in every atom, that Thou art the soul, only Reality of that stomach. Heavenly, Holy Reality, we will try not to be such hypocrites and infidels as every day of our lives to affirm our faith in Thee and then immediately begin to tell how sick we are, forgetting that Thou art everything and that Thou art not sick, and therefore that nothing in this universe was ever sick, is now sick, or can be sick. Forgive us our sins in that we have this day talked about our backaches, that we have told our neighbors that our food hurts us, that we mentioned to a visitor that there was a lump in our stomach, that we have wasted our valuable time, which should have been spent in Thy service, in worrying for fear that our stomach would grow worse, in that we have disobeyed Thy blessed law in thinking that some kind of medicine would help us. We know, Father and Mother of us all, that there is no such thing as a really diseased stomach; that the disease is in the Carnal Mortal Mind given over to the World, the Flesh, and the Devil; that the mortal mind is a twist, a distortion, a false attitude, the Harmatia of Thought. Shining and Glorious Verity, we recognize the great and splendid fact that the moment we really believe the Truth, Disease ceases to trouble us; that the Truth is that there is no Disease in either real

Body or Mind; that in the Mind what seems to be a disease is a false belief, a Parasite, a hateful excrescence, and that what happens in the Body is the Shadow of the lie in the Soul. Lord, help us to believe that all evil is utterly unreal; that it is silly to be sick, absurd to be ailing, wicked to be wailing, atheism and denial of God to say, 'I am sick.' Help us to stoutly affirm with our hand in Your hand, with our eyes fixed on Thee, that we have no dyspepsia, that we never had dyspepsia, that we will never have dyspepsia, that there is no such thing, that there never was any such thing, and that there never will be any such thing. Amen."

* * *

PLASTER WARPAGE. By Dr. Stewart Spence, Harriman, Tenn. In the late Prof. Richardson's valuable and well-known text-book, "Practical Treatise on Mechanical Dentistry," fifth edition, is given an account of an experiment in plaster of Paris by Dr. Bowman Macleod, late professor of the University of Edinburgh, Scotland, which would, if the professor's deductions were correct, be of exceeding value. As I have lately conducted a series of experiments along this same line, and arrived at conclusions opposite to those of Dr. Macleod, and as the subject is very interesting and important in itself, the more so because it has entered into the standard literature of dentistry, I here submit the matter to the attention of the profession.

To present the case clearly, I will quote from Dr. Richardson's book. He, commencing at the third paragraph on page 167, says: "A singular and hitherto unobserved phenomenon in connection with the setting of plaster mixed with plain water is pointed out by Dr. Bowman Macleod of Edinburgh, from which he draws conclusions so practically important concerning its influence in modifying the adaptation of a dental substitute, as well as in other respects, that space is here given to such of his observations as are deemed essential. A block of plaster was cast within a square of two feet, which on the following day showed an expansion of five-sixteenths of an inch in length and breadth. But I found, he says, that not only had the plaster expanded, but the upper surface was raised; and on sawing the block through in a diagonal direction, I found that instead of the block lying dead upon the plane beneath, it presented a concave surface toward the plane, the highest point of which measured one-half inch. This shows, first of all, that the plaster

had not only expanded, but had done something more than its now greater length and breadth would lead one to suspect; for in thus taking a concave form it must have either retracted to an equal extent, or expanded in an irregular manner, causing warpage. Making still further experiments by casting plaster in the ordinary impression cup, I found invariably the same results produced, and that the center portion—the palatine portion—of the cup always presented an open and well defined space between the upper surface of the impression cup and the lower surface of the hardened plaster. This circumstance, therefore, would produce in your model a fault similar to that resulting from the sucking of the waxy or resinous impression materials, and, as you can readily see, would give you a much higher dome than that of the natural arch. Hence the rocking of the plate, which has hitherto been attributed, if my deductions be justified, to every cause but the right one. * * * Naturally, then, I began to inquire how this defect might be overcome; and I find that by the addition to the water with which the plaster is mixed of potash alum (hitherto used entirely for the purpose of quick setting in impression making) in the proportion of from three to four ounces to the gallon, you will entirely overcome the irregular expansion and consequent warping which takes place in coarse plaster of Paris as used with water alone. Here you have the two blocks of equal dimensions; one cast with water and the other with potash alum water. It requires no explanation on my part to point out the difference between the two. In one case the expansion is five-sixteenths of an inch; warpage, one-half inch. In the other, expansion, nil; and warpage, ditto; and the two surfaces dead. * * * The conclusion I draw from this is, that all plaster, either for impression making or for models, should be cast with potash alum, when strict and definite results are to be obtained, and that in the case of gum block work the opening of the joints * * * may now be entirely prevented by the use of potash alum for both matrix and model within the flask."

It may be remarked in passing that the professor in writing this closing sentence evidently overlooked the fact that plaster yields under compression, and that the pressure of the model, through the rubber, on the blocks forces them outward and apart, compressing the plaster investing them. But that is a small matter.

Potash Alum.—If it were true that potash alum (the sulphate of

alumina and potassium; now officinal) would totally prevent expansion of plaster of Paris, it would be a very important fact; but I have every reason to believe that such is not a fact. The attention of the dental profession in America was first called to potash alum by Dr. Thos. Fletcher of England. In referring to some experiments I had made in plaster with ammonia alum (the sulphate of alumina and ammonia; the officinal), he said: "Alum, as properly understood, means the sulphate of alumina and potash (potash alum). Its action with plaster of Paris is totally different from that of ammonia alum, which for some years past has been sold in the place of potash salt, to which the name was originally given. A solution of potash alum, boiling hot, instead of softening plaster, will make it so hard that it is difficult to cut or break, and it will cause plaster which has lost its power of setting to set again, although not sufficiently hard for use."

I obtained some of the then rare potash alum, but was unable to produce with it casts that were especially difficult to cut or break. While setting hard, they did not set much harder than plain plaster, even when mixed with water boiling hot. Worse still, I was unable to get any less expansion with potash alum than with the ammonia variety. About a year ago I renewed my experiments with potash alum, but with similarly unsatisfactory results. Some eight or ten casts, poured in an upper impression cup, in proportions of alum averaging from six to forty grains to the fluid ounce of water, showed best results with six grains. The very large quantities set free a gas which, if the mix was not stirred long, produced a porous cast; and long stirring causes expansion. Its power of reducing expansion was, at the best, but about fifty per cent or less. Thinking that possibly they have a different alum in Great Britain to that in use here, I wrote to the Dean of the University of Edinburgh, as I had heard Dr. Macleod was dead. My letter was referred to Dr. Munro, Lecturer on Prosthetic Dentistry, who answered it, admitting that in his opinion Dr. Macleod's experiments "did not prove that there was no expansion, but only that there was no warpage in the one cast with potash alum, and that the expansion was less." This confirmed my views as to the limited power of potash alum in controlling the expansion of plaster. Dr. Munro also gave me a piece of information which led to the solution of the mystery of the "doming" of the two feet square block of plaster

cast by Dr. Macleod. He said that Dr. Macleod had surrounded his plaster with an iron band, and that the plaster square was only two inches in thickness. It immediately occurred to me that this iron band had caused the doming of the central region by preventing lateral expansion. And if this were true, it would, of course, follow that the flanges of our impression trays act similarly. I had previously been impressed that the large space often seen between the tray and the plaster impression at the palatal arch was too great to be accounted for by the linear expansion of the impression.

I therefore imitated Dr. Macleod's experiment, though on a much smaller scale, by pouring plaster in a cast iron ring about four inches in diameter on a marble slab. In order to discourage this mix from bulging downward instead of upward, I laid a board on the top of the iron ring, but so as to not touch the plaster, and placed on this board a weight consisting of a zinc die and lead counter die. I then poured an equal quantity of plaster on the marble slab beside the other, but without any band around it. These casts when hard were each sawed asunder in the midst, and it was found that the encircled one had domed up, while the other remained flat. Thin pieces of paper could be drawn without strain from under the banded cast at any point distant an inch or so from its circumference. This experiment was again made, this time with a different plaster, but with similar results. The latter two casts were not sawed asunder, but tested for doming by moistening the surface of the marble slab and laying them down on the wet surface. The banded cast absorbed only the moisture near its circumference, while leaving a little pool in the center, but the other dried up the entire region on which it lay, and its suction to the slab was also much greater than that of the other.

Second Experiment.—Although this was conclusive, a further test was made thus: I took a smooth board about sixteen inches long, and screwed down on its face at each end a cleat, then poured plaster on the board reaching from cleat to cleat. This strip of plaster was about three inches wide and three-fourths of an inch thick; its length was thirteen inches. It was left free at the sides, and confined only at the ends. It was clear that if the warpage described by Dr. Macleod arose from his iron band, and not from any phenomenal disposition in plaster to draw up in its center, this strip of plaster would bow up at or near its middle, and that

another strip not confined by the cleats would lie flat. I had not long to wait, for in half an hour this bowing up was observable, and by next morning four sheets of paper could be inserted between the plaster and board at the point of greatest doming. It was then removed from the board to make room for the plaster of the next experiment, and on being placed back three or four days later it was found to have arched yet more; so much, in fact, that twelve thicknesses of the same paper would now go between it and the board. This gave a space of about one-twentieth of an inch. I am utterly at a loss to comprehend this latter warpage, for numerous experiments with plaster in impression cups seem to indicate that warpage does not continue after expansion ceases, and expansion ceases in a day or two.

Next, on the same board, but reaching not quite to the cleats, was poured a similar strip of plaster. This latter showed no bulging, but lay perfectly flat on the board, and remained so after being removed therefrom. At no time since has it shown any warpage. Having been allowed to expand laterally, it had no desire to bulge or dome. It may be doubted that plaster ever warps, as used in dentistry, except from the cause here indicated.

Unfortunately I found no way of carrying this line of experiment into the impression tray itself; but this was not necessary, for these previous experiments were demonstrative. The effort of the plaster to expand laterally meets with the resistance of the unyielding flange of the tray, and the plaster domes up at the palatine arch. I found by experiment that a tray with a removable flange, consisting of a strip of cardboard paper waxed on to the tray (from which the metallic flanges had been cut) before taking the impression, and stripped off immediately after, largely prevented this bulging by permitting almost free lateral expansion. But this is a doubtful advantage, for what the impression gains by preventing doming at the palate it loses from expansion outward, and therefore it is a question of two evils. In a mouth with soft palate the doming might be preferable to the lateral expansion.

It is obvious that a similar bulging occurs in the model, which meets in the buccal and lingual surfaces of the impression similar resisting walls to those met by the impression in the cup. Nor do these two bulgings counteract each other, for both proceed in the same direction. By this restriction of the lateral expansion and

doming in the center, the resulting plate would fit closely to the buccal and lingual surfaces, but rock on the palate. How far the removal of the entire upper portion of the palate by a relief chamber of large area would counteract the two domings under consideration, I cannot say, but should imagine the results would be good, especially if the tin used to produce the relief be only just thick enough to counteract the warpage without creating a permanent chamber.

However, this means of relief does not especially interest me, as I have found an agent capable of entirely preventing the expansion of plaster of Paris, and even, if need were, of producing contraction in it; and also because this warpage of impression and model is only one of several features which have to be considered in making vulcanite plates on plaster models in order to produce exact adaption, on which I have made some important discoveries from experiments, all of which I hope to be able to publish to the profession in a little while.—*Items, March, 1902.*

* * *

COMBINATION OF PLAIN AND GUM TEETH. By H. Greely, D.D.S., Ellsworth, Me. For the last few years the trend in plate work is to use plain teeth in preference to gum teeth, even when the alveolar process is sufficiently absorbed to permit the use of the latter. The chief reason for this preference is the ease with which single teeth can be ground to the model, or, I should say, the lack of grinding needed by plain teeth as compared with block teeth. But when one takes into consideration the festooning and polishing of the rubber around plain teeth, the time and labor thus expended more than offset the extra work of grinding gum sections.

Another reason is the greater variation possible in the mounting of single plain teeth; but do dentists, as a general rule, avail themselves of these desirable features? Is it not a fact that nine-tenths of those using single teeth set them as evenly as possible, instead of trying to imitate nature and make the resulting denture look a little less stiff and artificial? Unless we are to avail ourselves of the desirable advantage which single teeth offer in the imitation of natural irregularities, I would use the gum sections in preference every time, for no one can deny that a mineral gum is far superior to any rubber or celluloid substitute now in use, as at their best and when freshly polished they are a poor imitation, but when they lose

their luster, which they soon do, they then become rough, slimy and offensive.

Thinking there might be a compromise between the two, last spring I took an upper set of gum teeth minus the molar blocks and ground the teeth all away, just leaving the festoon outline, as it is shown in Fig. 1, then ground these skeleton gums to the model, after which I selected plain teeth as nearly as possible like those destroyed, and ground them as nicely as I could to the indentations in the gums. Then proceeding in the usual way, I found I had a

FIG. 1.



FIG. 2.

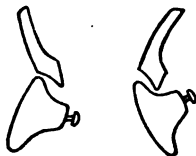
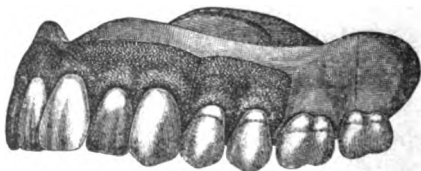


FIG. 3.



FIG. 4.



set of gum teeth in which I could make any variation desired. In this my first trial plate I packed pink rubber quite freely, so that the red or black rubber composing the body of the plate would not squeeze through and show. Then in the mouth an observer could not tell but that they were solid blocks.

When showing this first trial plate to Dr. Chilcott of Bangor, the thought occurred to both of us, Why not use in place of the pink or white rubber some of the numerous mineral bodies so much in use now? So I removed the teeth and gums from the old plate, remounted on a new model as before, then mixed some plaster and

invested the central and bicuspid blocks on one side; when hard enough warmed them slightly, so they would free themselves from the wax. When this was done there was quite a space left to be filled, and the more space the better, if mineral body is to be fused in it.

I filled in the space described with some low-fusing material, invested that side in sand and plaster, then cut the plaster from the face of the blocks, and sent to my friend Dr. Chilcott, who has an electric furnace and who kindly offered to assist me by fusing it. He of course had to add some body to the space left over the teeth, and this when fired gave it an excellent color and natural effect.

After remounting and finishing the plate we were agreeably surprised, for we had an irregular, natural-looking set of *gum* teeth. By this method one can lap one tooth over another, cant in or out, have spaces between the teeth, have flat gums or bulging, and if we desire one tooth shorter than the others, grind it off at the neck instead of the cutting edge. If, as is often the case, fuller gums over the cuspids are desired, add extra body and fuse it.

If manufacturers of teeth, already having the gum teeth molds in great variety, could by some means separate the tooth from the gums before baking, and have the gum veneers quite thin, thinner than they are now made, it would be comparatively little more work than at present to make an artistic looking set of teeth at reasonable cost. Rubber plates, which in so many instances are offered at such a ridiculously low price, can by the expenditure of more skill be enhanced in value and appearance so much the more. As regards the strength of this work, I omitted to state that in several cases of broken teeth on gum sets where the gum itself was not fractured I have ground out what was left of the tooth and fitted a plain one in its place, one which I first put in has lasted three years and is still all right.

If the tooth were countersunk at the upper end to allow the rubber, celluloid, or fused mineral to enter, it would strengthen the hold of the tooth to the plate. In the two plates I have made I used the single molars, but now wish I had used the gum blocks as at present made, for the set would look better, and being out of sight in the mouth it would be no advantage to set them uneven.

One can fracture any gum section by long vulcanizing, so I experimented with one set to see if it would break in the festoon

where the mineral was fused, I vulcanized it one hour and it came out all right. I then put it back and ran it another hour and found the gums cracked straight across, not following the outline of the tooth, and on the other side of the plate where no mineral body was used there was no fracture.

Where no fusing material was used I beveled the upper edge down toward the face of the veneer, and the lower edge of necessity had to be beveled up to fit the neck of the tooth in. It was dovetailed in so firmly that I fractured one corner of the gum in removing it from the first plate I made. I am rather fussy and particular in my plate work to have nice joints and well finished sets, but in these two plates I have purposely gone to the other extreme to show what irregularities can be produced.—*Cosmos, April, 1902.*

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LEPTOTHRIX RACEMOSA IN RELATION TO DENTAL CARIES. By G. W. Watson, L.D.S. Read before the Odonto-Chirurgical Society of Scotland. In 1888 Dr. Vicintini of Italy made a most interesting and valuable discovery in connection with the organisms associated with dental caries. He found, figured and described an organism of a higher type than usually obtains in the mouth, which he said is invariably found in great abundance adhering to the teeth in gelatinous plaques, and which he named *Leptothrix Racemosa*. He asserted that this is the parent organism of most of the bacteria in the mouth, and it certainly looks as if there was same truth in this, as preparations made from scrapings of teeth exhibit all the different varieties usually found in the mouth as well as the characteristic peculiarities of *Leptothrix Racemosa*. Vicintini exhibited chromo drawings of this organism, and represented it as showing four different stages, the highest of which was an arrangement of spores round a central stem, forming club-shaped masses, and the organism which produced this spore was the parent form of nearly the whole forms of microorganisms of the mouth, *Leptothrix* filaments so common in the mouth being just portions of the stems. He described the parent organism as being composed of fertile filaments or stems containing in their interior gemules, and attached round the stems by very fine threads are a series of spores in six or more longitudinal series.

Little or no attention was paid to this important communication for some years till Mr. Mummery and Dr. Miller took it up and

were able to make out with certainty the club-shaped bodies described. Later on Dr. Williams worked at the subject and was able to show, by means of a series of beautiful photomicrographs, the various forms assumed by the organism, and established beyond doubt that this is a new and hitherto undiscovered microorganism. It is most remarkable that this organism has so long been overlooked by bacteriologists. Dr. Williams points out that this is probably due to the fact that the organism can be demonstrated only by special methods of staining, and that if mounted in balsam it does not show up at all.

Dr. Williams's method of preparations is as follows: Wash with a stream of sterilized water the surfaces between two teeth, and with a small sterilized knife scrape the surfaces. The pasty-looking mass so obtained is placed in a clean watch glass, and covered with twenty or thirty drops of a rather watery solution of methyl violet in aniline water for twelve hours, occasionally tearing it apart to allow stain to penetrate. Pour off stain and wash with sterilized water, and then with equal parts of glycerol, alcohol, and water. Remove this, and put a drop of mixture on a clean glass cover; put the stained mass into it, and invert onto a clean glass slide, when it can be examined with the microscope.—*Record, April, 1902.*

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URINALYSIS FOR THE DENTIST. By H. H. Boom, M.D., Philadelphia. Read before the Southern Dental Society of New Jersey, Dec. 18, 1901. On certain occasions it is not only desirable but essential that the dental practitioner shall make a clinical examination of a patient's urine. This is particularly true when it is proposed to administer a general anesthetic. A patient presenting for dental treatment may be suffering from an unrecognized or masked renal disease. If to such a patient a general anesthetic be administered, his physical condition becomes infinitely worse, and his disease, assuming an active phase, soon reaches a fatal termination. A few unfortunate cases of death in the dental operating chair during the administration of a general anesthetic have been reported.

If the dentist takes the time to perform a few of the simpler tests upon the urine of his patients, the results would show whether the administration of ether or chloroform be admissible. It is not expected that the dentist shall make an exhaustive examination of the urine

that is often required of the physician, but he should ascertain with certainty the presence or absence in the urine of albumen and of glucose. A knowledge of the specific gravity will prove of considerable help by indicating the tests necessary in our inquiry. In conditions of health the urine has a specific gravity ranging from 1015 up to 1025. Should the specific gravity be lower than 1015 the urine should be examined for albumen. If the specific gravity be much greater than 1025 a careful search for glucose should be made.

In obtaining the specific gravity of urine we can make use of the urinometer. Perhaps a neater method for obtaining the specific gravity of urine consists in the use of the specific gravity beads. An instrument is offered us in the shops that enables us to use the specific gravity beads with neatness and a fair degree of accuracy. It consists of a cylindrical glass tube, resembling a small test tube, constricted and open at both ends. Inclosed in this tube is a series of six glass beads, each bead plainly numbered; the beads bearing the numbers, "5," "10," "15," "20," "25," "30." The beads are placed in regular order in the tube, the lowest in number being at the upper part of the tube, the bead numbered "30" at the bottom of the tube. The glass tube is then constricted above and below the beads so that the latter cannot drop from the tube, although they can move freely along the tube without passing each other.

To use the appliance, we close the lower end of the tube and fill the tube with urine. We may find beads numbered "5," "10," and "15" leaving the rest and floating towards the top of the tube, while the other beads stay at the bottom of the tube. This would indicate that the specific gravity of the specimen was greater than 1015, as the bead numbered "15" had floated towards the surface of the liquid, but the specific gravity of the liquid was not as high as 1020, as bead numbered "20" was not upborne by the liquor. After using the instrument it can be readily cleaned by flushing it with water.

It must not be thought that all specimens of urine having specific gravities lower than 1015 or greater than 1025 necessarily imply existence of disease. Nor, on the other hand, should we infer the absence of disease in our patient if the urine has a normal specific gravity.

Trustworthy Test for Detecting Albumen.—We first make a

saturated solution of common salt, chlorid of sodium, in distilled water, being sure to add to the water all the salt that will dissolve, and if the resultant liquid is not perfectly clear and transparent, filter through cotton or paper. This solution will keep without change. To test for albumen, fill a test tube about three-quarters full with urine, then add the saturated salt solution until the tube is full of the mixture, add two or three drops of strong acetic acid, and holding the tube in the fingers by its bottom, heat the upper layer of the fluid over a bunsen flame, or lamp chimney, until the mixture boils. Then, without shaking the tube or its contents, examine the layer of fluid in the upper part of the tube, comparing its degrees of transparency with that of the fluid that was not heated in the lower part of the tube. If the heated portion of the fluid is in the slightest degree hazy or less transparent albumen is positively present.

To Detect the Presence of Glucose in Urine.—Place urine to the depth of an inch in a test tube. Add half as much liquor potassæ, U. S. Ph. Mix the two fluids by shaking the tube. Then add two or three drops of a five per cent solution of copper sulphate in distilled water. Do not heat this mixture, but allow the tube to stand undisturbed for from twelve to twenty-four hours in the cold. At the expiration of that time, if glucose be present, there will collect in the tube an ochre yellow to brick red precipitate of fine sand-like character of suboxid of copper. This test is a modification of Trommer's test, and unlike the usual form of Trommer's test, requiring application of heat, the formation of suboxid of copper can occur only through the presence in the urine of glucose and of no other substance.—*Items, March, 1902.*

* * *

HOT CARBOLIC ACID. By N. S. Jenkins, D.D.S., Dresden. About a fortnight ago I had an inspiration. Life had become a burden because of an overgrown, anemic, timid, nervous, hyper-sensitive, seventeen-year-old German-Russian boy, whose heredity and whose training had bred the conviction that if he were uncomfortable there was something radically wrong in the construction of the universe. All European practitioners are familiar with the type. When grown to manhood men of this class can storm Plevna, or go through a winter's campaign in the Balkans laughing at danger and rejoicing in hardship, but are liable to faint when baring the arm for vaccination.

The temptation to temporize with such a patient is often almost irresistible, and sometimes, indeed, temporary operations are indicated; but in this case there was no question as to what duty required. Permanent operations were necessary, but how were the cavities to be prepared? Having selected one of the most difficult compound cavities, and with infinite precaution prepared the edges and cut down the jagged masticating surface and dried it as well as possible, considering that neither cold, nor warm, nor hot air could be tolerated, I suddenly resolved to try hot carbolic acid. A bit of cotton was saturated with boiling hot carbolic acid and slowly and gently insinuated into the cavity. It worked like magic. Sensation ceased at once. In three minutes the bulk of the soft decay could be painlessly removed, and after two other applications the last vestige of diseased tissue was easily obliterated. Never had I seen an obtundent work so quickly or so effectually. The chip-blower could be used at once. Layers of softened dentin could be peeled off from over a nearly exposed pulp and a permanent filling made with unexpected ease.

Since then I have used this method in other cases, and have become convinced that in cavities in soft and immature teeth and with partially devitalized pulps which still cling to the walls of the root-canals with obstinate tenacity, and where gangrened pulps have brought teeth to the very verge of abscess, we have in hot carbolic acid a therapeutic agent of great potency. It is questionable if it will be of much value in cavities in dense teeth, or in cases of sensitive erosion, but if my original conviction is confirmed its combination with other agents—as for instance, cocain—will naturally follow and may greatly extend its field of usefulness. Twenty per cent cocain with hot carbolic acid seems more efficient.

It is most probable that others have used this remedy in the same way, for "there is nothing new under the sun," but never having seen notice of it, I hasten to impart the results which I have obtained, in the hope that my limited but promising experiences may lead to more thorough investigations in the way of alleviating human suffering.—*Cosmos*, March, 1902.

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SALIVA, AND SOME ACCOUNT OF THE WORK OF DR. MICHAELS WITH SAME. By Edward C. Kirk, D.D.S., Philadelphia. Read before the Academy of Stomatology, Oct. 22, 1901.

Last year a paper was published in the *International (DENTAL DIGEST, Feb., 1901,)* in which Dr. Michaels gave his views on the relation of the saliva to the production of erosion or chemical abrasion of the teeth, and made the remarkable statement that it was due to sulphocyanid of potassium. I had the opportunity a year ago of listening to his paper before the International Congress in Paris, and afterwards made a rather careful study of the paper upon sialo-semeiology, and I decided that if the opportunity afforded I would take occasion to make personal investigation of his remarkable claims, for they are remarkable. Hitherto the saliva has been regarded simply as a fluid containing a ferment, ptyalin, capable of converting starch into maltose, also some salts, mucin, and water. That is to say, it is a fluid which has a certain digestive property, but is mainly useful for lubricating a bolus of food so that it may be comfortably swallowed. Dr. Michaels, as the result of his studies, takes an entirely different view of the question. Apart from its physiological function, he regards the saliva as affording the very best medium which we have for arriving at a conception of the status of nutrition. He says the saliva more accurately represents the composition of the blood than any of the other bodily fluids. Physicians have been investigating the urine with reference to normal nutrition and pathological conditions, but Dr. Michaels regards the urine as of secondary importance in this relation. He says that it is an excretion by a gland specialized in character, and does not stand in such close physiological relationship to the blood-current as does the saliva. He holds that the saliva represents the blood-current more accurately, because it is a secretion from the blood, and that it may contain everything in the blood-stream which is crystallizable and therefore that is dialyzable through a glandular structure. He says that the saliva is swallowed as it is secreted and passes through the nutrition cycle over and over again, and in performing this evolution it picks up the soluble materials in the blood-stream and presents them in solution.

I became interested in the matter because, in the study of the diseases of the mouth, the theories held with reference to caries, and the question of erosion of the teeth, as well as of the invasion of the soft tissues of the retentive apparatus by bacteria, it seemed to me that the whole atmosphere of dental pathology had become

so beclouded with the bacteriological question that we could not see beyond it. We had gotten to the point where we were regarding every disease as produced by bacteriological influence, and had lost sight of the important fact that there were many cases in which, though bacteria were present, the same class of organisms that were exciters of diseased conditions, no pathological results occurred. There is something in the nutritional status of the individual, and that nutritional status is, of course, related to and dependent upon conversion of food in the organism, through the process of cell metabolism, into energy, tissue, and waste products, by which process there is produced somewhere along the line of nutrition the state which we call vitality or life. The question of internal vital resistance to disease invasion seems to be involved in the process of nutrition, and has a most important bearing on the predisposing causes of disease.

Dr. Michaels has found, and I think has very clearly demonstrated, that the percentage and character of salts found in the saliva bear a distinct relation to the intensity of the disease. As the blood-current becomes loaded up with these crystallizable waste products of nutrition, there is an osmotic overflow into the saliva; therefore the quantity of these contained salts is important evidence of the state of the blood, which in turn is dependent upon the nutritional status. He claims to be able to determine from an examination of the saliva and blood the disease of diathetic state. It seems from his researches that it is an extremely simple matter to be able to differentiate people into two large classes—those whom he calls the "hyperacid" individuals, whose saliva contains acid calcium and sodium phosphates, and possibly urea or uric acid salts, in quantities which may be detected and determined by the microscope. These salts exist in what he calls the "hyperacid diathesis," of which the rheumatic and gouty individuals are well-known examples. On the other hand, there is an opposite type which he calls the "hypo-acid individual," whose condition is characterized by a different class of salts in the saliva. After a little practice one may with great ease and readiness recognize the two classes of salts and so determine the diathetic states.

The technique of examination is extremely simple. A specimen of mixed saliva of all the glands is taken. The mouth is first rinsed with water, so as to remove the food particles; no attempt at steril-

ization is made. After a sufficient quantity—a dram or two—is collected, then with a dropping-tube several drops are deposited on a white porcelain tablet and the saliva is rapidly put through a series of qualitative tests, in order to determine its general character. The first test is made with one of the ferric salts, usually ferric chlorid, in ten per cent solution, in which we get a reaction showing the sulphocyanid of potassium, if it be present. The intensity of the color determines to a certain degree the diathetic state. Dr. Michaels has found in the gouty individual of the hyperacid diathesis that the sulphocyanid tends to disappear, so if he finds a saliva not giving any or a weak reaction to ferric chlorid he begins to suspect that the individual is of a gouty type. If the individual is of a rheumatic character and the amount of sulphocyanid is above normal, you get a more vivid coloration. When we speak of being “above” or “below” normal, the normal standard is arrived at by making examinations of saliva with respect to the sulphocyanid test in a number of individuals who are in normal health. So you obtain after a while a conception of the standard of coloration, and you can determine whether the coloration is too intense or wanting in intensity.

Another test that is made on the porcelain tablet is for the existence of ammonia or ammoniacal salts, and is done by Nessler’s reaction, which gives a characteristic brownish color if any ammoniacal salts are present. They may or may not be present. Chlorids are determined by the addition of silver nitrate in a decinormal solution, using yellow potassium chromate as an indicator, which is a well-known test for chlorids in the laboratory. He makes a test for glycogen, the presence of which he regards as a measure of health in the individual. If it be present in the saliva, he says that individual is in good health. It is the material into which the proteid substances taken in as food are converted in an available form for assimilation, and its presence in the saliva indicates that the system has stored up a quantity more than sufficient for its needs. Its absence does not mean ill-health, but its presence is an indicator which has a strong bearing on the existing status of the nutrition.

The third test on the porcelain tablet is the reaction of the saliva with reference to litmus paper. A great deal of light has been thrown on the question of salivary reaction by the work of Michaels.

It is put down in the text-books as being alkaline or neutral. It may be strongly acid, alkaline or neutral, or may be both alkaline and acid, i. e., amphoteric. That is to say, where the saliva contains disodium phosphate, and where it also contains the acid sodium phosphate or acid calcium phosphate, one may get in the same saliva a reaction to either blue or red litmus paper. The same condition is found in urine. So the acidity or alkalinity is to be expressed in terms of the proportions of sodium phosphate or acid calcium phosphate present.

Dr. Michaels lays a great deal of stress upon the mode by which various kinds of saliva undergo decomposition. I saw salivas of all ages that he had kept for weeks, months, and even years, and these salivas were decomposed in various ways. Salivas from patients affected with some derangement of the liver decompose with a dark brownish or greenish coloration. In the hyperacid cases, the rheumatic and diabetic cases, the color will be more of a reddish type, and these color results of decomposition form part of the history of the case which enables him to make up his diagnosis.

The most striking feature of his investigation is the microscopical study of the salts in the saliva after they have been crystallized. In all the works upon urinalysis and physiological chemistry that I have studied—and I have gone over most of the standard authors, both in English and in French—I have found but one reference to the use of the polariscope in the study of these crystalline forms, though the study of the urine sediments and crystal forms is now elaborately worked out. Dr. Michaels has laid great stress upon the use of the polariscope in the study of these crystalline forms in the saliva. He differentiates these salts which are polarizable from those which are not, and thus makes a subclassification. He has found all the acid salts to be highly polarizable. The whole process seems to resolve itself into two things—first, the study of crystalline forms in saliva, with a view to understanding its chemical composition, that is, by making an analysis of it by the microscope and chemically by the use of reagents; second, to understand the pathological significance of these findings, whatever they may be. What does it mean when we find so much urea and acid calcium phosphates in the saliva? The bearing of such questions on diseased conditions is the final and most important problem.

I went so far with Dr. Michaels as to study his general methods,

and have reached a point where I am ready to begin the work. I have spent some months on it now. By beginning the work I mean seriously to take up the systematic study of salivas of a uniform line of cases of the same disease and to see if there is any common factor running through them, and to study those conditions as compared with normal conditions.

Dr. Michaels asserts positively that he is able to make a diagnosis of any well-known disorder by his method. The technique of making specimens is quite simple. He makes them in duplicate. A large drop of the saliva is deposited on a microscopical slide and covered with a round cover-glass. Alongside of that is placed an uncovered drop of saliva. One such slide is placed in a warm chamber so that evaporation takes place at about 105° F. That gives him specimens for immediate study. The other is allowed to dry spontaneously at room temperature, being merely covered over with a bell-glass to prevent particles of dust from coming into it, and is then studied under a microscope. I have brought with me to-night the microscope with a poliscopic attachment and some specimens which I would like to show to as many as can see them. I think you will agree that the appearance shown in these specimens of saliva taken from diseased individuals are, if not characteristic, at least strongly suggestive of that idea, and hold out the promise of great utility in the matter of diagnosis. Bear in mind that the quantity of salts present seems to be related to the intensity of the disease, and not only enables us to say, "This man is of such a diathesis," but when the characteristic salts are present in small quantities we will not regard him as a very sick man, and where the saliva is loaded down with them we have reason to suspect that the man is very ill; in the cases that I have studied thus far this fact seems to be borne out. If this investigation yields many of the results which it promises I believe that we have one of the most important means of diagnosis given to us in recent years. It furnishes us with a key that after awhile may present the problem of caries from an entirely different viewpoint. The question is constantly being asked why it is that this or that particular theory does not fit a certain case. I have very great doubts as to whether the type of caries seen in the mouths of young children or adults, where approximal surfaces are attacked and where the disease is running rampant, is the same as that found in the gouty or hyper-

acid type of individual, where it seems that an acid substance is exuded from the gum margin and where decalcification is girdling the tooth. Dr. Michaels finds that these different types of caries are related to diathetic states and to variations in the composition of the oral fluids, and that they have different causes. The nearer we get to an understanding of the original causes of this disease the better able will we be to prevent and cure it. I must say, with reference to my study with Dr. Michaels, that it was exceedingly gratifying and was one of the most hopeful things that I have met in dental pathology.—*International, April, 1902.*

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ARE THE TONSILS TO BE REGARDED AS NORMAL PHYSIOLOGICAL ORGANS OF THE BODY? By Francke H. Bosworth, M.D., New York. It is an ancient teaching, and one, I think, almost universally accepted both by the laity and by the profession, that the faucial tonsil constitutes one of the normal organs of the body in much the same sense that the liver and the kidneys do, and that it is endowed with certain important functions in the economy. It follows, therefore, that having important functions to perform, its absence or extirpation robs the system of those functions with a resulting deleterious influence. As to whether this teaching be a true one or not, I do not intend to make too positive a statement, and yet it seems to me that there is ample ground for questioning this view, in that it oftentimes seriously hampers us in carrying out what seem to me to be clear clinical indications.

The anatomists tell us that the tonsil is an almond-shaped organ, situated between the two pillars of the fauces, and that its inner face is marked by from seven to twelve openings, which openings constitute the orifices of a similar number of lacunæ or blind ducts; the organ itself being covered by normal mucous membrane which extends down into the lacunæ. And yet the anatomists tell us that even this is not a constant condition, and that in a large proportion of infants nothing is found more than a small aggregation of lymphoid bodies containing no lacunæ, and lying beneath the mucous membrane. When we consider the extreme liability in child life to the involvement of the lymphatic bodies in hypertrophic changes, it seems fair to suggest that really the healthy tonsil may be the one above described, viz., one which consists of nothing more than a small aggregation of lymphoid bodies underlying healthy mucous

membrane, and containing no lacunæ or blind ducts; and that the almond-shaped body usually described by anatomists is really a morbid growth.

The physiology of the tonsil has long been a subject of painstaking and laborious investigation, the problem being no nearer solution to-day than before. The same may perhaps be said of the whole lymphatic system, which, as we know, is found distributed extensively throughout the entire economy. Curiously enough, these lymphatics are found grouped rather extensively at that point of the human system where in the development of fetal life the hypoblast and the epiblast meet, viz., in the fauces, forming what is oftentimes called the lymphatic ring, and establishing four points where these bodies are aggregated in notable masses, viz., between the two pillars of the fauces, one on either side, forming what are called the faucial tonsils; in the vault of the pharynx, forming what is called Luschka's tonsil; and in the glosso-epiglottic fossæ at the root of the tongue, forming what is called the lingual tonsil.

Now, as we know, those masses between the faucial pillars have always figured in anatomy as forming normal anatomical and physiological organs of the body. Since the establishment of our specialty of larynology we occasionally meet somewhat vague descriptions of that mass of lymphatics in the vault of the pharynx, as constituting a normal anatomical and physiological organ of the body, under the name of Luschka's tonsil. These descriptions are very rare, very indefinite, and by no means constant in literature. I know of no anatomy or physiology which describes the masses at the root of the tongue in the same sense. Why this should be it is difficult to say, for it seems to me it is a fair conclusion that the masses at the vault of the pharynx and root of the tongue possess claim to a position as normal organs equal to those masses between the faucial pillars. The only reason perhaps that can be given for the physiological dignity to which the faucial masses have attained, is that they are so much more prone to become the seat of diseased action, and were open to direct ocular inspection in this diseased condition centuries before the others were recognized.

What the function of the lymphatics in the economy may be I do not intend to discuss. It has always seemed to me, however, from a clinical point of view that, considering the universality of their distribution, they were situated throughout the system for the pur-

pose of arresting or retarding the encroachment of disease germs, thus acting, as it were, as a sort of police force; and considering, in the light of modern bacteriology, what enormous duties are imposed upon these little bodies, it seems easy to understand how much they are liable to suffer in the encounter; and especially is this true of those bodies between the faucial pillars, lying as they do in the sort of eddy which is established by these two muscular folds.

Whether this is the immediate cause of lymphatic hypertrophy I will not discuss, but the almost universality of a certain amount of lymphatic hypertrophy in some part of the body at every age is recognized by us all. That it should so frequently take the special form that it does in the faucial tonsil, viz., in forming deep lacunæ, I should regard to a certain degree as adventitious; but these crypts are by no means constant, as you know, even in hypertrophy of the tonsils. When they exist we have an organ which lends itself admirably to what constitutes one of its principal activities, that is, as a trap for disease germs. It is difficult to understand why nature should place these sponge-like bodies in a normal throat. I think a far better and clearer understanding of clinical indications would be to regard this mass with its lacunar traps as a diseased body, for in support of this view it is not necessary to recount the very large number of infectious diseases which result from the mechanical entrapping of the disease germ in this sponge-like body. I think this teaching is notably emphasized by the numberless observations published in the last few years of the different germs found lodged in these filthy lacunæ.

Some twenty years ago, at a meeting in London, I made the observation in debate that practically there are no tonsils in a healthy throat. This observation was received with contemptuous jeers. After twenty years of additional clinical observation I am disposed to repeat the same remark before the members of this society with a certain amount of curiosity as to how it may be received here. I do not wish to make the observation with absolute positiveness, and yet I repeat it seems to me that if this view were more generally accepted it would make clearer the clinical indications in the treatment of many cases of throat disease. It would remove many supposed objections to operating upon the tonsils; and, moreover, if such a thing were impressed upon the laity, we would meet with fewer objections to operations for extirpation of

tonsils which are absolutely indicated by every clinical symptom. We so often meet with objections on the part of our patients: "The Lord put them there, and why should we remove them." I usually respond as the only answer to this: "The Lord never put them there, he had nothing to do with the matter; it is a diseased process which practically constitutes a morbid growth or tumor, and should be thoroughly removed, in the same manner as any other tumor, whether it be fibroid or malignant." We often hear as an objection to operating instances quoted of tonsils having been removed, and the throat left in a worse condition than before. I have met with many cases of this sort, and in all of them the subsequent symptoms were either due to some other cause, or the morbid tissue had been only partially removed. This question of thorough extirpation, I might say here (somewhat parenthetically) is one on which much emphasis should be laid, for I think it is a matter within the observation of all of us that a partial extirpation of a tonsil occasionally leaves the throat in as bad, if not in a worse, condition than before operation. Moreover, I am disposed to think that there is no other diseased condition met with in the fauces which gives rise to morbid symptoms in so large a proportion of cases as hypertrophy of these lymphatic bodies between the faucial pillars.

I think we have therefore some justice for advocating the view that the almond-shaped organ in the fauces, which the old anatomists called the tonsil, has not justified its claim to be considered one of the normal organs of the body, either on anatomical, physiological, or clinical grounds. I think that we may go still further, and say that it constitutes a distinct menace to the health and welfare of the body in the filthy lacunæ which make up its main bulk.

If it is a natural growth, rather than the result of a diseased process, then it seems to me that nature had been guilty of a crudeness of design which shows no analogy in the human economy, unless it be possibly in the vermiform appendix—*Medical Record*.

HUMAN DEVELOPMENT.—Prof. Henry L. Brunor, head of the biological department of Butler University, Indiana, makes, says the *Philadelphia Medical Journal*, a startling prediction as to human development. He sees in the future man a being in whom strange transformations shall have taken place; a being in whom brain is master, ruling a body much larger than that of the present man; a body which has lost its floating ribs, its vermiform appendix, and its little toes, and in which many other changes have taken place. He believes the chest and upper and lower limbs will be larger, and that the future man will be much taller than his prototype of to-day.

Letters.

THE BOSS IS BETRAYED IN THE HOUSE OF HIS FRIENDS.

(AS TOLD BY THE OFFICE BOY.)

One Day me an' the Boss was in the Dental Depot an' in come Dock Puffy, Dock Measly, Dock Hotty, an' Dock Timrus, what's President of the Odontologicostomatitital Society. They all got to talkin' about some new Surgical Operation invented by a dentist out in Omaha, er somewhere. It was somethin' to make Artificial Plates stick better. I listened, an' as near as I could Make Out it was somethin' like this—the man what invented the new way, he said he'd noticed the main reason why plates wouldn't stick, was because they wasn't usually a very good Alveolar Ridge. So then his Scheme was to cut a deep Groove around where the Ridge had orter be, an' tuck in a Chicken Wish-Bone, an' let it grow tight. Then you take a Impression an' go ahead. The inventor's name was Dock Hiflutner, an' he was a M.D. as well as a D.D.S.

I seen right away that the discovery was makin' a Great Stir among the dentists. In Fact the dental journals that the Boss borried from Dock Measly that week was both full of it. So I wasn't a bit supprised when I heered that the Society had app'inted three members to go as a delegation to Omaha an' see Dock Hiflutner, an' learn exactly how he Done it, an' how he happened to think of such a Thing, an' all about it. Then they put Dock Puffy an' Dock Hotty an' Dock Measley on the Committee, an' they went off the Next Mornin', only Dock Puffy he Backed Out, when he heered Dock Measly was a-goin' so they put Dock Peabody in his Place.

In a few days the Committee come back, full of Enthusiasm an' Stuff, praisin' Dock Hiflutner to the Skies. Dock Hotty described him as a gentleman havin' a Eagle Eye, an' his Chist a-stickin' out so the Top Buttons of his vest was Busted Off. He said he had the Ear-Marks of a Born Scientist, a man what once havin' got a Notion in his Head, would hold on to it Onflinchin', ef the Universe was to Ixplode. People from all over was Flockin' In to see him, an' git their Teeth Examined Free. He was so Offul Busy that he'd had to start a Inkubator.

The Excitement got so Strong presently, that it was decided to call a Special Meetin' of the Odontologicostomatitital Society at once, in order to consider what the perfession throughout the World had orter do, seein' as the Discovery was bound to overturn an' revolutionize all previous existin' Notions about Dental Surgery. The Boss he was about as Enthusiastic as the Rest, although I suspicioned he was feelin' a trifle Sore 'cause he hadn't been named on the Committee. But he kep' right along in the Procession with the others fer quite a Spell. Then one day he found out he'd been Mistaken, all the While; he'd thought it was some sort o' Practical Dinkey to go inside the Plate an' hold it up. When he found out it wasn't that, he begun to Weaken. Before long he got Sarcastic, an' talked Funny about the discovery, rediculin' Dock Hiflutner out an' out. Dock Puffy an' Dock Hotty, an' in fact several of the Society members they Sneered at the Boss, an' Dock Puffy he warned him he'd better Keep Still, without he wanted to git himself Turned Out o' the Society. Then the Boss he got reel Defiant, an' he told Dock Puffy an' the rest that they be Dam, an' he was a-goin' to say what he believed, an' ef they didn't like it they could Lump It. He said Dock Hiflutner wasn't nothin' but a Blather-Mouthed Fraud, an' he'd write him a letter an' tell him so, first thing they Knowed. (The Boss he's kind o' Mild an' Non-Resistin' ordinarily, but you git him Stirred Up an' he'll Bust Right Out with what he thinks whether or no.)

Well, he went on gittin' madder an' madder, seein' the others all Smilin', an' directly his bein' so Offul Mad seemed to have a mos' curious effect on Dock Puffy. Says he to the Boss, "Blame it all, Dock, I'm a man of Lib'ral Notions, an' I like a man to Stand Up to his Convictions, even ef I don't agree with him. Now you do this, you git up in the Society Meetin' an' you Blaze Right Out what you think o' this, an' I'll agree to stand by you. It'll Make a Mighty Hot an' Interestin' Discussion." So then him an' Dock Hotty kind o' Whispered together Slyly, an' Dock Hotty he said he thought that was a Capital Idee. He said the Society needed a good Stirrin' Up, an' the Boss was the very man to do it, an' he'd stand by him too, ef he'd do it. I noticed he kind o' Hunched Dock Peabody, settin' nex' to him, on the Sly, an' I reckoned somethin' was Up, though what it was I couldn't Imagine.

When the Night of the Called Meetin' come, I went along to

managè the Magic Lantern for Dock Hotty. He was goin' to Exhibit some Slides, showin' how the Wish-bones grewed Tight. They was a Big Crowd o' Folks present, includin' about twenty dentists that wasn't members of the Society, not to mention nearly a Hundred dental students, an' several Doctors. Dock Timrus, the President, was in the Chair. He looked round the Room like he was Skeered to Death, an' d'rectly he hit the Table with his Little Mallet, or Gravel, (what you call it), an he Called Out in a Feeble Vois, "Come to"—like somebody had Fainted. Nobody didn't Pay no Attention, what with Talkin' an' Laughin' so he pounded agin, Reel Hard, an' looked round Bold an' Courageous, like he wasn't a-goin' to be Afeard, no matter what Happened. Says he, "Gentlemen, the Hour has Arrove, fer comin' to—that is, I should say—er—we have met this Evenin' to—to—consider Wish-Bones—I mean—"

Dock Timrus he pounded agin Offul Hard with the Mallet, like it was somebody a-talkin' had throwed him All Out. So then Dock Puffy he Jumped Up an' announced the Object of the Meetin', Dock Timrus seemin' to have sich a offul Stage Frite, so you could n't tell whether he was a-tryin' to announce a Weddin' er the openin' of the Base-ball season. Then when Dock Puffy had Set Down everybody set silent, lookin' like it was a Offul Solemn Subject before the House, an' it had n't order be approached too Familiar. I could see the Boss he was Waitin' fer Dock Puffy er Dock Hotty to Lead Off with sayin' they Suspicioned Dock Hifutner was a Humbug, then he'd Sail In an' give him Fits himself. The Boss he was a -settin' right between them two, an' he'd kind o' hunch Dock Puffy, an' then he'd hunch Dock Hotty, but they neither one o' them had anythin' to say. It seemed to me they acted Offul Dumb.

After a Long Pause Dock Peabody he Got Up. He moved that a Vote of Thanks be got up fer Dock Hifutner, an' that they be spread on the Minutes an' over the Discoverer of the New Invention. That brought Dock Hotty to his Feet. He said it was a Premature Motion, an' they'd order discuss the question of this Discovery a Spell, first, So then he Set Down, an' dead silence Rained, the members settin' there lookin' Dismal, like it was a Prayer Meetin' an' everybody wishin' the Clock would strike Nine. After a Long Spell o' waitin' the Chairman he ast Dock Hotty would he

open the Discussion. But Dock he shook his Head, only murmurin' somethin' about preferrin' to heer from Dock Puffy. Then the Chairman he ast Dock Puffy would he say some Remarks, an' Dock Puffy he kind o' Shied Off, without givin' him no Satisfaction. They was another long Spell o' waitin'.

Finally Dock Puthoff, what gin'rally waits till everybody else has Spoke, got up. He said to his Thinkin' this was the Mos' Important discovery in the Annuals of Dental Science. The mos' Important in fact, in the Annuals of any Science. The Medical Perfession would jis' about haf to Throw Up the Sponge now; all that had ever been accomplished in Medical Colleges was n't nothin' to this. This seemed to Settle one thing: the Medical student, to keep up with the Procession, would haf to take a Course in Dentistry hereafter.

After he Set Down it seemed like Nobody wouldn't Talk. Dock Puffy he kep' a-lookin' at the Boss, like he wondered why he didn't Git Up. So did Dock Hotty. So at last the Boss he got up, sure enough. An' the Way he Sailed Into that Dock Hiflutner was a Caution. He said the Report o' the Committee strangely enough hadn't been called for by the Chairman, but that didn't reely matter. He knowed all about what had been seen an' learned by the Committee, an' he was prepared to say that fer Unadulterated Gall, Presumption, Humbuggery, this Dock Hiflutner took the Cake an' all the Fancy Dress Suits an' Wall Decorations of the Cake-Walk. Anybody with even a Elementary Knowledge of Histology orter see at a Glance that you couldn't make a Wish-Bone grow in a Human Jaw. In the first place it hadn't no Root. Now ef it had been a Cancer er a Bunion he'd implanted, they might possibly be some sense in it all. Furthermore, this Dock Hiflutner was proposing Ruthlessly to deprive the millions o' Innocent Children throughout the Land of the pleasure an' satisfaction o' breakin' Wish-Bones, an' makin' Wishes. It was Cruel, Inhuman, Outrageous. An' there was Serious Objections to the Whole Scheme. In the first place, insertin' Wish-Bones in Garrulous Old Peoples jaws, was liable to make them Cackle wuss than ever. An' anyhow, Wish-Bones was n't the Best Thing, Whale Bone had orter do still better, ef they was anything in the Scheme—which they wasn't.

In conclusion the Boss said he'd got a Scheme of his own to make plates Stick. It was to cultivate four or five Abscesses about the

teeth, an' train 'em so as they'd form Fistulous Openings in the roof of the Mouth, little Suck-Holes, so to Speak. He said ef the Society would appoint a Evenin' for the Purpose, he'd like to show how these little Suck-Holes would hold up a Plate.

After he'd Set Down Dock Puffy, who'd been listenin' with a kind o' Sardine-ic Grin on his Face, riz up. He Opened Up in a mild, soft tone of Vois, but as he went On you could easy see he wasn't no Archangel come down from Heaven to bear the Boss away to Supernal Bowers. Before long he Lit Into the Boss, Might an' Main. He said he hadn't the First Instincts of a Original Scientific Investigator, an' it was a Disgrace to set an' listen to a man Swayed by Prejudice like he was. He said they was plenty o' Narrer Souls in the Perfession jis' like him. He said they wasn't no Sense nor Reason in the Boss's suggestion about substitutin' a Whale-Bone fer the Wish-Bone. He called attention to the fact that the Speaker had utterly failed to observe the astuteness of the Scientist he had Criticized, in choosing a Wish-Bone, a bone from a biped, an' therefore in Harmony with the Human Economy. Only a man Utterly Ignern't of Scientific Principles would Make sech a Brake as that. He hoped Dock Contour would go home an' set up the rest of the Night, an' see ef he couldn't somehow put a Crimp in himself, an' learn himself some Sense.

After Dock Puffy set down, Dock Hotty he took a Whack at the Boss, an' then Dock Peabody he got up an' he called him Names, an' the Boss he was Struck Blind with Surprise, an' he couldn't even Gasp fer Breth. I had to pound him on the Back. Things got Wuss an' Wuss, presently; all the Members, young an' old, pilin' onto him. Even some o' the Dental Students made Speeches Impidint an' Insultin', sayin' they'd Heered he wasn't only a Quack, anyhow. Finally Dock Timrus he called the Vice-President to the Chair, an' he made the speech of his Life, blastin' the Boss from A to Z. But the Fiercest Attack of all was made by Dock Somebody er Other, a Stranger, who'd been Introduced as Dean of a Brooklyn Dental College. He jis' Skinned the Boss alive, sayin' that sech men was the mos' Pestiferous Obstacle to a Perfect Union between the Medical an' the Dental Perfessions, henderin' Scientific Progress, buttin' agin Investigation in all its Phases, an' a lot More.

I had to lead the Boss out an' git him in a Cab, to take him

Home, after they' Adjourned the Meetin', he was so Overcome. He was abed Two Days, an' the Doctor said he'd had a Narrer Escape from Nervous Prostitution. He was Offul Mad at the Society, an' when he got so he could hold a Pen, he Writ his Resignation. But they never took no Action, an' he couldn't Find Out whether it was accepted or not. He wouldn't speak to none of the Members for Weeks. Then one day Dock Puffy he passed by, an' the Boss Tackled him at the Door. Says he, "You're a Nice Friend an' Champeen of a feller Society Member in Distress, *you are!*" Dock Puffy he seemed Took Aback, so says he, "What's the Matter?" Says the Boss, "You'd orter ast that Question! Look at the Way you served me, Jumpin' all over me in the Meetin' after you'd said you'd Stand By me! You an' Dock Hotty too!" Dock Puffy he give a kind o' Little Quirk, an' says he, "Well, didn't me an' Hotty both of us Stand by you? We wasn't neither one of us more'n Five Feet from you any time durin' the Discussion. Want a Feller to stand on your Foot?" The Boss he said somethin' about that bein' a Medium Poor joke, an' went in the House.

That afternoon Dock Measley he Give It away to me, that the whole Cocking-Main was a Set-Up Job. Dock Puffy, Dock Hotty an' himself, had hatched out a Conspiracy to lead the Boss on, an' they'd invited everybody to the Meetin' to help Lambast him an' enjoy the Fun. He said the Dean of the Brooklyn Dental College, what give the Boss the Red-Hottest Roast, wasn't only a Auctioneer what sells Snide Watches an' Joolry, an' he himself had Writ his Speech fer him, an' some o' the Dentists made up Five Dolers to pay him fer Firin' it Off. But when Dock Measley he Told the Boss, he wouldn't listen to no explanations, an' they couldn't git him to come to the Society, till they'd offered him a resolution of Apology, an' had sent Dock Hiflutner a Nother Resolution givin' him Blazes.

Cincinnati, O.

FRANK W. SAGE, D.D.S..

IRRITABLE THROATS.—Patients who gag under the touch of even a wire tongue-depressor may be made to open their throats by looking at themselves in a hand-glass, when the physician can simultaneously obtain an unobstructed view.—*N. Y. Lancet.*

ESSENTIAL OIL that forms the base of all perfumes is a powerful antiseptic, and possesses disinfecting properties equal to those of carbolic acid. A perfumed handkerchief, therefore, may not only please the sense of smell, but prove a guard against infection.—*Lancet.*

The Dental Digest.

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Where All Communications Should be Addressed.

Editorial.

BLINDED BY CONCEIT.

In the June *Items of Interest* appears this editorial squib: "The editor of the DIGEST apparently has devoted so much of his time fighting patents that he has overlooked the copyright laws entirely. In the March number of the DIGEST, among the "Original Communications," appears an article entitled "Tin—A Plea for More Conservative Methods in Filling Teeth," by Dr. T. D. Shumway, Plymouth, Mass. This paper was first published in *Items of Interest*, and was copyrighted. The DIGEST has not only republished the matter, but has done the author the injustice of omitting the copyright claim."

The facts in the case are as follows: Dr. Shumway first read his article before the Harvard Odontological Society, Dec. 27, 1900, and it was first published in the July, 1901, issue of the *International*. When reading it before the Harvard O. S. Dr. Shumway reserved the right to present it to the Vermont State Dental Society at its coming meeting, and he therefore read it before that body March 21, 1901. The Society voted its papers to the DIGEST for publication, with the provision that we were to furnish copies to the *Items*. It was some time before the secretary turned over the papers to us, and a still further delay was caused by the failure of some essayists to forward their papers, but when they were finally all in hand we took copies and sent the originals to the editor of the *Items*, as per the request of the Society. Under date of November 7, 1901, Dr. Ottolengui wrote: "I have retained Dr. Shumway's paper, the others not being available for publication in *Items of Interest*. They are therefore returned to you."

Dr. Ottolengui now states that Dr. Shumway's article "was first published in *Items of Interest*." The facts are that it was published in the March, 1902, number of the *Items* and in the March, 1902, issue of the DIGEST, and instead of this journal having

"republished the matter," it was through our courtesy that Dr. Ottolengui received the original of the article before it was published in the *DIGEST*.

In responding to a toast at the annual banquet of the Central Dental Association of Northern New Jersey last February, Dr. Ottolengui said: "I think the only journal of any consequence whose editor is not a professor is *Items of Interest*." We cannot believe that Dr. Ottolengui wilfully or maliciously misstated the facts about Dr. Shumway's paper, but in view of the above remarks it is plain that he has become so blinded by conceit that he imagines the dental world revolves around him and his journal. In all kindness we would recommend to him a careful reading of *Æsop's* fable — "The Frog and the Ox."

NATIONAL DENTAL ASSOCIATION.

The annual meeting of the National Dental Association will be held at Niagara Falls the last four days in July. Many matters of importance will be discussed, proposed amendments to the constitution and by-laws and to the rules governing the sections will be acted upon, and a change in the date of meeting will be considered.

It is to be hoped that some time can be decided upon which will be satisfactory to all concerned, as this changing the date each year by a postal card vote is childish and creates much dissatisfaction. Generally those who are most anxious to change the time of meeting do not attend, and this year those for whom the change was made have so arranged their plans that it will be impossible for them to be present.

All this is outside of the literary reports, papers and discussions, which are of great value and interest. Another matter quite as important as any that we have mentioned should be brought up, namely, some plan whereby a closer bond of union between the National and the state and local societies can be secured. The dental is far behind the medical profession in this respect, and we could well pattern after the excellent plans and improvements recently made by the American Medical Association, which now draws recruits from all over the United States. Every reputable dental school should send delegates, and every dentist interested in the welfare and progress of his profession should attend. Not only will he be fulfilling his duty, but he will derive much benefit from

the meeting. The sessions held at Niagara Falls are always the largest, and the attendance this year bids fair to surpass that of previous meetings. We earnestly urge our readers to make their plans now to attend.

A BIG COMPANY IN SMALL BUSINESS.

For several years past the *Dental Cosmos* has been the official organ of the National Dental Association, publishing its papers and proceedings and those of the Southern Branch. Last year the publishers thought the *Cosmos* was again to be favored, so they reported the proceedings of the Southern Branch which met at Nashville in July. However, when the National met at Milwaukee in August, it decided to give the proceedings to the DIGEST for publication, and make that journal its official organ, hoping that in this way the proceedings could be gotten out in less than one year after the meeting, which had not been the case previously. According to the constitution and by-laws, each branch must furnish a copy of its proceedings, papers and discussions for publication with the transactions of the National Association. The *Cosmos* therefore could not use the report which it had made, but was in duty bound to turn it back to the Southern branch, to be forwarded to the secretary of the National. The DIGEST was under no obligation whatever to pay the expense of this report, but wishing to be perfectly fair in the matter we sent the S. S. White Co. a check for \$100, which amount they stated they had spent on the work. In the February and April, 1902, issues of the *Cosmos* the papers and proceedings of the Southern Branch appeared almost verbatim and nearly as complete as in this journal, the publishers evidently having kept a copy of the matter which they turned over to us and for which we paid them. Not a line of credit was given to the DIGEST, and the matter was published in the same department as other societies to whose proceedings the *Cosmos* is entitled, the obvious intent being to make it appear that the *Cosmos* was still the official organ of the Southern Branch. Comment is unnecessary.

A. C. PROBERT IN A NEW ROLE.

In the October, 1901, DIGEST we published the questionable literature sent out by A. C. Probert, President of the so-called hospital at Niles City, Mich., and called attention to the probable fraudulent

character of the proposition and of the institution. As Probert continued to do business, we published in the April, 1902, DIGEST evidence to prove that he was an ex-convict, having served a term for embezzlement in the state prison at Waupun, Wis. After this exposure we did not suppose he would have the effrontery to ever show himself in a public capacity, but it is reported on good authority that he has filed articles of incorporation at Springfield, Ill., and has obtained a charter authorizing him to conduct a postgraduate dental school. Prominent men of Chicago have been approached by him and his agents and invited to join the faculty of the new venture. Owing to his past record and character the DIGEST does not suppose any reputable practitioners will join with him, but for fear that some may not be aware of all the facts in the case we again call attention to this individual. It will be remembered that Probert published the names of several prominent dentists as being on the faculty of his snide hospital at Niles, and despite the fact that these men published disclaimers and protested vehemently against the use of their names, he continued in so doing. Consequently, we would warn any dentist who values his reputation against coming in too close contact with this ex-convict.

Notices.

ILLINOIS BOARD OF DENTAL EXAMINERS.

A meeting of the Illinois State Board of Dental Examiners will be held at the office of J. G. Reid, Secy., 1006 Champlain, Bldg., State and Madison streets, Chicago, July 8, 1902, at 9 a. m. J. G. REID, D.D.S., Sec'y.

DELAWARE STATE DENTAL SOCIETY.

At the annual meeting of the Delaware State Dental Society, held June 10-11, 1902, the following officers were elected for the ensuing year: Pres., C. R. Jefferis; V.-P., C. J. Kinkead; Sec'y, R. H. Jones; Treas., S. H. Johns; Librarian, Ed. Lewis.

WASHINGTON STATE DENTAL SOCIETY.

The annual meeting of the Washington State Dental Society was held at Tacoma, May 22-24, 1902, and the following officers were elected: Pres., F. R. Fisk; 1st V.-P., N. G. Covey; 2d V.-P., R. S. Williams; Secy., A. B. Bailey; Treas., W. M. King.

NEW YORK STATE DENTAL SOCIETY.

The New York State Dental Society held its annual meeting at Albany, May 14-16, 1902, and elected the following officers: Pres., R. H. Hofheinz;

V.-P., W. T. Turner; Secy., W. A. White; Treas., C. W. Stainton; Correspondent, H. D. Hatch. The next meeting will be held in Albany, May, 1903.

MICHIGAN STATE DENTAL ASSOCIATION.

The annual meeting of the Michigan State Dental Association was held at Grand Rapids, June 9-11, 1902, and the following officers were elected for the ensuing year: Pres., E. A. Honey; V.-P., C. C. Noble; Secy., F. H. Essig; Treas., J. Ward House.

KENTUCKY STATE DENTAL ASSOCIATION.

The Kentucky State Dental Association held its annual meeting at Covington May 19-21, 1902, and elected the following officers: Pres. J. S. Cassidy; V.-P., J. F. Clark; Sec'y, F. I. Gardner; Treas., F. R. Wilder. The next meeting will be held in Louisville, May, 1903.

CONNECTICUT STATE DENTAL ASSOCIATION.

At the annual meeting of this Association, held at Hartford, May 19-21, 1902, the following officers were elected: Pres., Ed. Eberle; V.-P., T. W. Johnston; Sec'y, F. Hindsly; Asst. Sec'y, C. P. Prentice. Treas., E. B. Griffith; Ex. Com., G. O. McLean, E. B. Abbey, J. E. Heike; Librarian, W. H. Metcalf; Editor, J. W. Harper.

CALIFORNIA STATE DENTAL ASSOCIATION.

At the annual meeting of the California State Dental Association, held at San Francisco, June 10-12, 1902, the following officers were elected for the ensuing year: Pres., Frank L. Platt; 1st V.-P., L. Van Orden; 2d V.-P., W. J. Taylor; 3d V.-P., W. G. Knowles; Rec. Sec'y, C. E. Post; Cor. Sec'y, O. P. Roller; Treas., T. N. Iglehart.

SOUTH CAROLINA STATE DENTAL ASSOCIATION.

The annual meeting of the South Carolina State Dental Association was held at Charleston, May 14-16, 1902, and the following officers were elected: Pres., A. T. Pete; 1st V.-P., T. Dotterer; 2d V.-P., D. Aiken; Treas., T. W. Dix; Cor. Secy., I. M. Heir; Rec. Secy., G. A. Smith. The next meeting will be held at White Lithia Springs.

ALABAMA STATE DENTAL ASSOCIATION.

The Alabama State Dental Association met at Tuscaloosa, May 14-16, 1902, and elected the following officers for the ensuing year: Pres., W. E. Proctor; 1st V.-P., H. C. Hassell; 2d V.-P., N. N. Vann; Sec'y, J. T. Cook; Treas., W. D. Fulton; Member Ex. Com., J. C. Wilkerson; Mem. Ex. Board, J. A. Allen; Press Editor, T. M. Allen.

NEBRASKA STATE DENTAL SOCIETY.

The annual meeting of the Nebraska State Dental Society was held at Lincoln, May 20-22, 1902, and the following officers were elected: Pres., H. J.

Cole; V.-P., H. A. Shannon; Rec. Sec'y., W. R. Clark; Cor. Sec'y., H. H. York; Mem. Board of Censors, B. L. Spellman. The next meeting will be held the third week in May, 1908, at Lincoln.

GEORGIA STATE DENTAL ASSOCIATION.

The thirty-fourth annual meeting of the Georgia State Dental Association was held at Macon, June 10-12, 1902, and the following officers were elected for the ensuing year: Pres., J. M. Mason; 1st V.-P., Sam. Rambo; 2d V.-P., E. A. Tignor; Rec. Sec'y, S. H. McKee; Cor. Sec'y, O. H. McDonald; Treas., H. A. Lawrence. The next meeting will be held at Tallulah, June 10, 1903.

TEXAS STATE DENTAL ASSOCIATION.

The annual meeting of the Texas State Dental Association was held at Waco, May 13-15, 1902, and the following officers were elected: Pres., J. G. Fife; 1st V.-P., T. P. Williams; 2d V.-P., R. D. Griffin; Secy. and Treas., Bush Jones; Curator of Museum, A. F. Sontag; Ex. Com., W. R. Rathbone, A. J. Beville, C. O. Webb. The next meeting will be held at Houston in May, 1903.

LATEST DENTAL PATENTS.

- 700,855. Mold for casting plates, W. Streetman, Cleburne, Tex.
- 701,616. Crown-slitting forceps, C. J. Reynolds, Pittsburg.
- 701,627. Dental electromotor switch, E. Schreier, H. Dumler, Vienna, Aus.
- 701,799. Dental matrix, W. Crenshaw, Atlanta, Ga.
- 702,073. Dental electric switch, E. O. Pieper, San Jose, Cal.
- 703,376. Flask-locking device, D. A. Baker, Schenectady, N. Y.

MASSACHUSETTS STATE DENTAL SOCIETY.

The thirty-eighth annual meeting of the Massachusetts State Dental Society was held at Boston June 4-6, 1902, and the following officers were elected: Pres., A. J. Flanagan; 1st V.-P., Wm. P. Cooke; 2d V.-P., B. H. Strout; Sec'y., E. O. Kinsman; Treas., J. T. Paul; Librarian, T. W. Clements; Editor, W. E. Boardman; Ex. Com., J. F. Dowsley, Chairman; A. J. Flanagan, W. P. Cooke, W. E. Boardman, D. H. Allis, J. R. Piper, J. F. McLaughlin.

NATIONAL DENTAL ASSOCIATION.

The sixth annual meeting will be held at Niagara Falls, N. Y., July 28-31, 1903. A good program is being prepared, and a large and profitable meeting is anticipated. A rate of a fare and third for the round trip, on the certificate plan, has been secured on all roads in the United States and part of Canada. Certificate must be taken and full fare paid when purchasing ticket going, and this certificate when properly signed entitles the holder to return for one third fare. Tickets may be bought going from July 22-29, and the certificates for return may be used as late as Aug. 4.

A. H. PECK, Rec. Sec'y., Chicago.

MISSOURI STATE DENTAL ASSOCIATION.

At the annual meeting of this Association, held at Jefferson City, May 21-23, 1902, the following officers were elected: Pres., S. C. A. Rubey; 1st V.-P., J. H. Kennerly; 2d V.-P., F. W. Franklin; Cor. Secy., Otto J. Fruth; Rec. Secy., H. H. Sullivan; Treas., J. T. Fry; Board of Censors, A. M. Magee, R. J. Winne, W. M. Bartlett; Com. on Ethics, A. J. Prosser, W. H. Renoe, J. B. McBride; Publication Com., Wm. Conrad, W. G. Goodrich; Com. on History, B. L. Thorpe; Com. on New Appliances, S. T. Bassett; Com. on International Dental Congress During Louisiana Purchase Exposition, W. M. Bartlett, Wm. Conrad, F. F. Fletcher, M. C. Marshall, L. G. McKellops, H. Prinz, B. L. Thorpe. The next annual meeting will be held at Kansas City.

OTTO J. FRUTH, Cor. Sec'y.

RESOLUTIONS ON THE DEATH OF DR. EBI.

The Cedar Rapids Dental Society passed the following resolutions on the death of its honored member and ex-president, Dr. Edward Ebi.

WHEREAS, In the death of our friend and fellow practitioner, Dr. Ebi, this society has sustained the loss of a beloved member, who by his dignity and counsels added much to the profit and interest of its meeting, and who as its president for two terms did all in his power to promote the welfare and high professional standing of its members, and

WHEREAS, We each feel the loss of a true personal friend whose kindly smiles and deep experience did much to cheer and encourage, and

WHEREAS, We believe that the welfare of humanity through his professional attainments was ever his aim and ideal, and his every act was never to bring discredit upon his profession, therefore be it

Resolved, That we pay such tribute to his memory as possible. That we extend our sympathy to the relatives and friends who also have suffered loss, and further be it

Resolved, That a copy of these resolutions be sent to his relatives, and that they be given to the local papers and professional journals for publication, and that they be placed upon the records of this society.

L. E. RICHADSON,
C. B. WHELPLEY,
GUSTAVUS NORTH,
Committee.

FIRST ANNUAL CLINIC OF SCHOOL OF DENTISTRY, UNIVERSITY OF ILLINOIS.

Held at the College building, 818 West Harrison street, Chicago, Wednesday, March 26, 1902. (Reported by Drs. F. W. and R. W. Parker.) This was one of the most successful clinical meetings ever held in the city. About seven hundred names were enrolled on the college register. Luncheon was served in the College building to all present. In the evening the College gave a theatre party to the clinicians and specially invited guests.

Clinic No. 1. Dr. L. P. Haskell of Chicago exhibited a number of models of difficult cases in the construction of artificial dentures, giving suggestions

as how to overcome the difficulties which arise in the construction of such dentures. Dr. Haskell also demonstrated the making and baking of a continuous gum case, using the Hammond Drop Furnace.

No. 2. Dr. J. H. Woolley of Chicago filled occluso proximal cavity in upper bicuspid by covering gingival wall and margin with non-cohesive gold, then filling cavity with cement. This method is held by the clinician to be superior to others, as the gold is not dissolved and the gingival portion of the cavity is protected and preserved.

No. 3. Dr. L. W. Nevius of Chicago administered nitrous oxid gas to several patients and skillfully extracted a number of teeth.

No. 4. Dr. F. M. Richardson of Chicago, administered nitrous acid gas, using the Hurd inhaler, by which the operator is enabled to prolong the anesthesia, and more time is afforded for the work. Dr. Richardson operated on a number of patients very successfully.

No. 5. Dr. A. O. Hunt of Chicago demonstrated the Griswold and Brewster methods of crowning.

No. 6. Dr. L. O. Green of Chicago used local anesthetic ("Accestoria") and extracted teeth quite painlessly for a number of patients.

No. 7. Dr. W. A. Stevens of Chicago demonstrated a method of removing one or more teeth from a vulcanite plate without any distortion of the denture, or checking of any surrounding teeth or of the teeth to be removed. The method is to apply to the teeth to be removed a coating of sperm or other oil. Then hold tooth to be removed directly over a small pointed flame. As soon as tooth is thoroughly heated it may be removed without difficulty. This was a very good demonstration of a practical point.

No. 8. Dr. R. N. Laurance of Lincoln, Ill., treated pyorrhea cases, using Younger instruments and others designed by the clinician himself. Glycophymoline was used as antiseptic during the treatment and recommended as a mouth wash. Lactic acid was used in the pockets about the necks of the teeth "to seal up wound and give Nature a chance to form scar tissue." The clinician used iodine, aconit, tannic acid and glycerin externally on gums.

No. 9. Dr. F. H. Skinner of Chicago prepared cavity in hypersensitive dentin under nitrous oxid gas administered with Hurd inhaler. The cavity was then filled with tin and gold until the pulpal wall was protected, and finished with platinum and gold folds. This combination of materials is said to conduct thermal changes less readily.

No. 10. Dr. C. E. Bentley of Chicago prepared mesio-lingual cavity in upper left cuspid and burnished therein a platinum matrix in which the clinician baked a porcelain inlay. The fit and color were good.

No. 11. Dr. W. O. Vallette of Goshen, Ind., exhibited a neat sterilizer of his own design in which the instruments are sterilized by boiling.

No. 12. Dr. G. V. I. Brown of Milwaukee showed several cases which he had operated upon at the school previous to the clinic. One of unusual interest was a case of empyema of the antrum of six years standing.

No. 13. Dr. J. W. Erringer of Chicago prepared proximo-occlusal cavity

in upper bicuspid and filled with gold, using Pack's cylinders. The finished filling presented a very nice appearance.

No. 14. Dr. H. H. Schuhmann of Chicago exhibited a porcelain inlay which he had made for a mesial cavity in upper lateral incisor. The inlay was made after the Peck method and was a nice piece of work, both as to fit and color.

No. 15. Dr. H. E. McDonald of Chicago gave a table clinic.

No. 16. Dr. F. E. Roach of Chicago exhibited a porcelain crown without band of his own design, also ingenious soldering pliers for use in soldering crowns.

No. 17. Dr. W. H. Dwight of Le Mars, Iowa, showed a detachable facing of his own design.

No. 18. Dr. C. H. Wambold of Chicago exhibited metal dies and counter-dies and the use of Hawl's moulding flask.

No. 19. Dr. F. C. Bryant of Chicago made a partial lower continuous gum case, using the Hammond Drop Furnace in baking.

No. 20. Dr. H. B. Tileston of Louisville made a gold inlay for disto-occlusal cavity of lower right bicuspid. Cavity was prepared so matrix would draw easily; a bite was taken in modeling compound; impression of the tooth containing cavity was filled with copper amalgam which had been allowed to set over night; bite was run full of plaster and placed on articulator; gold foil was burnished into cavity in the amalgam model of the tooth; then another piece of foil was soldered to the matrix along the line where the matrix covered the gingival margin of the cavity; a small hole was made in the matrix for the entrance of solder. Then matrix was replaced in cavity and reburnished, cavity was filled with pellets of cotton, over which were contoured the pieces of foil which had been soldered to the matrix, care being taken to get the contact point with the adjoining tooth, also to get the foil in contact with the margins of the matrix. Finally, all was removed, cotton burned out and the solder to fill the space inserted, after which inlay was trimmed and set with cement.

No. 21. Dr. C. P. Pruyn of Chicago gave an oral surgery clinic, a case of fracture of the lower jaw of five weeks standing, fracture occurring on right side just anterior to the third molar. There was much swelling and induration, which made the work very difficult. These were materially reduced by the application for thirty minutes of very hot compresses. Then occlusion was established and the teeth held in proper occlusion by means of wire ligatures which bound the lower to the upper ones. Food could be taken in liquid form through a tube introduced into the mouth through space on the right side made by the loss of teeth already extracted. This method of reducing such a fracture seemed adapted to the case.

No. 22. Dr. G. A. Miller of Chicago showed a simple and accurate method of making carved cusps for band crowns. Cusp carved in any manner, allowing for thickness of gold. Made counter-die of fusible metal and swaged with a plunger.

No. 23. Dr. Lester Bryant of Chicago formed and carved eight porcelain

crowns, six bicuspid, one cuspid and one lateral. Clinician showed much ability in this line, the work being well executed.

No. 24. Dr. S. M. White of Benton Harbor, Mich., demonstrated a method of preparing and filling diseased root-canals.

No. 25. Dr. Edmund Noyes of Chicago prepared a mesio-incisal cavity in upper left central incisor and filled with cohesive gold, finishing the labial surface and incisal portion with platinum and gold. The contour, finish and appearance were all that could be desired.

No. 26. Dr. W. C. Goldbeck of Chicago constructed on plaster models one shell and one open-faced crown, obtaining the measurements for the bands from the models. Contouring pliers alone were used for the work.

No. 27. Dr. A. G. Johnson of Chicago prepared roots for banded crowns, using instruments of his own design for the removal of the enamel.

No. 28. Dr. Chas. N. Reese of Chicago constructed a nine-tooth bridge from upper cuspid to second bicuspid on opposite side. Cuspid an open-faced and bicuspid a shell crown made by Dr. Goldbeck. Dr. Reese backed the facings and soldered bridge, demonstrating a method of his own for backing facings and for placing solder. Clinician used Parr's flux in soldering, dusting case with it while the latter was hot.

No. 29. Dr. G. B. Stone of Chicago constructed porcelain crowns by a new process, baking them with the Turner gasoline furnace and using S. S. White and Brewster High Fusing Porcelains. Fusible metal matrix was made over a metal tooth one-sixth larger than the desired crown, this to allow for shrinkage of porcelain. Body was forced into matrix and excess of moisture taken up by blotter. Matrix containing crown was then melted and crown removed and baked. This is an excellent method and the results were good.

No. 30. Dr. L. Phillips of Chicago presented a method of making a porcelain-faced crown. Cope made in usual manner, labial side of band made very thin; facing backed with pure gold or platinum and waxed in position with cope in place in mouth. Rope of pure gold laid around gingival margin of facing and then investment made and soldering done with 20 or 22 K solder. Then crown polished, the labial side of band being ground very thin.

No. 31. Dr. H. O. Browning of Chicago filled an occlusal cavity in upper right first molar, cutting the cavity to include grooves and pits.

No. 32. Dr. Hart J. Goslee of Chicago exhibited two removable bridges, using the Morgan attachments. The bridges were beautifully constructed and the fit and appearance all that could be desired.

No. 33. Dr. C. N. Trompen of Roseland, Ill., filled a mesio-occlusal cavity in an upper left first bicuspid, using hand pressure. The filling presented a very good appearance when finished, both as to contour and density.

No. 34. Dr. E. C. Brophy of Chicago baked a number of banded porcelain crowns, using a gasoline furnace of his own design. The results were very favorable.

No. 35. Dr. C. W. Miller of Toledo, Iowa, exhibited pliers to be used for contouring bands for crowns, also for shaping the cusps. The pliers have a number of interchangeable beaks and are of clinician's own design.

No. 86. Dr. F. H. B. MacDowell of Racine, Wis., demonstrated a method of using and caring for hypodermic needles.

No. 87. Dr. J. E. Hinkins of Chicago showed a method for the fixation of loose teeth. The teeth were first ligated with continuous ligature, then all was well dried and Kowarski's cement applied to the ligature. When set the cement was trimmed and smoothed.

No. 88. Dr. Don M. Gallie of Chicago. Gold filling in disto-occlusal cavity in upper left first bicuspid. Cavity prepared at a previous sitting. Cavity filled with Pack's gold pellets and finished with No. 80 foil. Filling when finished was excellent. Contour beautiful, contact normal, and restoration of normal interproximate space.

No. 89. Dr. G. V. Black of Chicago demonstrated to good advantage the use of the separator as an aid in finishing a gold filling on the proximate surface, and the use of the finishing files and knives of his own design. These latter instruments are very effective in their work, and once mastered are indispensable.

News Summary.

G. W. ELLINGTON, a dentist at Hempstead, Texas, died May 9, 1902.

D. E. LANE, 59 years old, a dentist of Hartford, Conn., died May 16, 1902.

W. MORRIS, a dentist at Forreston, Ill., died May 10, 1902, of consumption.

E. J. JOHNSON, 76 years old, a dentist at Rockford, Ill., died June 1, 1902.

C. E. CAMPBELL, a young dentist of Monticello, Ga., died June 8, 1902, of appendicitis.

E. A. KINGSBURY, a young dentist of Winona, Minn., was drowned May 23, 1902.

A. E. HORTON, one of the oldest dentists in Fitchburg, Mass., died May 31, 1901.

J. M. CHURCH, a dentist at Ottawa, Can., died June 1, 1902, from accidental poisoning.

W. J. STEPHAN, 29 years old, a dentist of Cleveland, died after a brief illness May 31, 1902.

NO TRIAL TO HIM.—Life is full of trials, but the lawyer confronts them all with the smile of a hero.

O. WHIPPLE, 65 years of age, a dentist at Olean, N. Y., died suddenly May 26, 1902, from heart disease.

LAUGHTER.—It is said that laughter is a cure for indigestion, but a man can't laugh when he has dyspepsia.

H. A. DEWEY, 67 years old, and for over forty years a dentist at Pontiac, Mich., died of paralysis June 1, 1902.

APROPPOS.—During a recent convention in Washington a shopkeeper had this placard in his window: "D.A.R. TERS should wear our G. A. R. TERS."

J. T. CHASE, 79 years old, and said to be the oldest practising dentist in Maine, died at Hallowell, May 26, 1902.

DUTY ON HOSPITAL INSTRUMENTS.—By a recent ruling, hospitals will have to pay duty upon medical instruments imported for their use.

BANKRUPT.—J. C. Gulick, a dentist at Brooklyn; liabilities, \$5,172; assets, \$57. A. E. Nichols, a dentist at Honolulu; liabilities, \$20,000; no assets.

BEARDS TABOORED.—The milk commissioner in New York has ordered that hereafter only smooth faced men shall be employed for milking cows and delivering milk.

BETTER WAIT.—Patient—"What would you think of a warm climate for me, doctor?" Physician—"Good Lord, man, that is just what I am trying to save you from."

DENTIST NEEDED.—It is reported that Stockham, Neb., needs a good dentist, and that the citizens of the village are tired of and disgusted with itinerant dental fakirs.

VERSATILE.—Ohio boasts a man who has on his letter-head, "Physician and Surgeon, Dentist and Optician." Pretty hard for any case to get away from that combination.

TAX FOR TRANSIENTS.—Cortland, Tenn., has passed an ordinance, levying a tax of \$25 for each visit upon all transient dentists and fixing a tax of \$5 annually upon resident dentists.

"ILLEGITIMATE" PRACTITIONERS.—A Texas exchange comments upon the large number of *illegitimate* practitioners in that state. O well, paternity is a secondary consideration anyhow.

PAWNED HIS WIFE'S TEETH.—A drunkard in Chicago this month took his wife's false teeth from her mouth while she was asleep and pawned them for a drink. Pity the whipping-post is not in vogue here.

LEBANON VALLEY (PA.) DENTAL ASSOCIATION last month elected the following officers: Pres., E. Tate; V.-P., W. P. Clark; Rec. Sec'y, H. J. Harbein; Cor. Sec'y, P. K. Filbert; Treas., C. B. Wagner.

JOURNALISM VERSUS HONESTY.—A writer in the *Atlantic Monthly* asks, "Can a newspaper editor be a strictly honest man?" Yes, for a few days. Then some one else will be the editor—if the paper is still alive.

DENTAL NEWS.—We had meant to announce ere this the advent of the *Dental News*, the latest addition to dental journalism. It is published in New York City by the Stowe & Eddy Co. We wish it all success.

BARE ARMS LEGALIZED.—It is useless, says the *Medical Standard*, for physicians to argue against short-sleeved dresses, as the constitution of the United States says: "The right to bear arms shall not be interfered with."

EXPENSIVE EXTRACTION.—A fireman in Louisville has been awarded \$500 damages in a suit which he brought against the captain of the engine-house for knocking out three teeth. The captain could have had the work done with less pain to patient and expense to him by some one licensed to extract teeth.

EL PASO COUNTY (COL.) ODONTOLOGICAL SOCIETY was organized at Colorado Springs May 15, 1902, and the following officers were elected: Pres., W. K. Sinton; V.-P., G. Y. Wilson; Sec'y, T. A. Johnston; Treas., J. A. Smith.

GERMANY APPRECIATES DIGEST.—In the May number of "*Zahnheilkunde*," one of the leading dental journals of Germany, twelve articles were reprinted from American dental journals—seven from the DIGEST and five from other sources.

SUSQUEHANNA (PA.) DENTAL ASSOCIATION elected the following officers May 16, 1902: Pres., C. C. Walker; V.-P., D. B. Williams; Treas., J. C. Hertz; Sec'y, F. W. Thomas; Asst. Sec'y, O. H. Uhler; Cor. Sec'y, W. C. Middaugh.

ANYTHING DENTAL.—The press clipping bureaus which serve the DIGEST are instructed to send us everything relating to dentistry, and we recently received a clipping stating that a butcher in Boston was remodeling his residential property.

NORTHERN OHIO DENTAL ASSOCIATION at its forty-third annual meeting, held at Cleveland, June 9-11, 1902, elected the following officers: Pres., J. F. Stephan; V.-P., W. H. Fowler; Cor. Sec'y, W. T. Jackman; Rec. Sec'y, C. D. Peck; Treas., D. A. Allen.

CORONATION.—"Whither away?" asked the inquisitive man. "To the coronation," answered the hurrying one. "What? Not to England?" exclaimed the interrogator. "Oh no," said the other, as he started off again, "only to my dentist to have a tooth crowned."

LAWRENCE (MASS.) DENTAL CLUB was organized May 26, 1902, and the following officers were elected: Pres., N. B. Russell; V.-P., F. W. Bevington; Sec'y, J. P. Reardon; Treas., W. H. Caffey. Ex. Com., C. W. Partridge, C. A. Kershaw, C. A. Frank. Meetings will be held monthly.

SCHOOL EXAMINATIONS BARRED.—The school board of Maryland this month refused a request made by the Maryland State Dental Association to be permitted to examine the teeth of the pupils in the public schools, and also to give brief talks to the students of the high schools on the care of the teeth.

LARGE MOUTH.—Dr. H. E. Becker, Owensboro, Ky., reports that he has just finished a set of teeth for a negro woman whose mouth is a record breaker, the back teeth having a spread of three and one half inches and the distance from front to back of the mouth being twice that of the ordinary individual.

TEETH SAVE LIFE.—A union picket on duty during the recent labor trouble in Chicago was shot at by a workman whom he was intimidating. The bullet passed through his upper lip and smashed all to pieces an upper set of false teeth which he was wearing, but went no farther and caused no injury except the wound in the lip.

DAMAGE SUITS.—A man at Albany, N. Y., on June 5 brought suit against a dentist to recover the sum of \$2,000 because two sound teeth were pulled. A newspaper man at Oakland, Cal., on May 22 brought suit against a dental

parlor in San Francisco, asking \$10,000 damages for injuries caused by incompetent and careless service.

MICROBIOLOGY.—Teacher. "Tommy, in the sentence, 'A microbe is a minute living organism', parse microbe." Tommy, "Microbe is a common noun, possessive case—Oh, yes it is—first person, microbe; second person, your crobe; third person, his—", and Tommy stayed after school.

FROG IN STOMACH.—A unique operation was performed in New York recently, says the *New York Medical Journal*, when a living frog was removed from the stomach of a woman. It was probably swallowed when a tadpole, and it is believed that it lived in the patient's stomach for five years. Frog lived for several hours after the operation.

LOVING CUP FOR DR. McMANUS.—At the last meeting of the Connecticut State Dental Association, held at Hartford last month, Dr. James McManus of Hartford, one of the founders of the Association and prominent in society work throughout the country, was presented with a loving cup by the members. One was never more deservedly given.

FAKES VIOLATING LAW.—The Merchants Association of Indiana has filed affidavits in the circuit court against a dental company with headquarters in Fort Wayne. The company has been selling tooth powder throughout the state and giving chances on presents with every purchase, and this method of doing business is alleged to be in violation of the state law.

TAXATION RULING.—An opinion of special interest to dentists has just been rendered by Attorney General Hamlin of Illinois. The question involved is whether office furniture and fixtures of professional men are assessable in the district where they are located, or where the owner resides. The attorney general decides that professional men may be assessed only in place of residence.

ILLEGAL PRACTITIONERS.—June 17 a dentist at Kenosha, Wis., was arrested for practising without a license. May 27 a dentist at Staunton, Va., was arrested for the same offense. The dentist at Vineland, N. J., whom we announced last month had brought suit for damages against the prosecutor of the state dental board for causing his arrest for practising without license, has been convicted.

MYSTERIOUS ORGANIZATION.—According to newspaper report C. A. Sykes, New York representative of C. Ash & Sons, was elected president of the American Dental Trade Association, which closed its annual meeting at Detroit last week. Will some one tell us what the American Dental Trade Association is, as we are unable to find it mentioned in the list of dental societies of the United States, and we are assured it is not the Dental Trust, as there is no such thing.

FIRES.—L. T. Cummins had his office burned out at Hempstead, Tex., June 4. Powell Dental Parlors, at Brooklyn, N. Y., were burned out June 2. A. C. Rich, Saratoga, N. Y., was burned out June 9. H. M. Robbins, Rockland, Me., lost \$400 by fire May 17. E. T. Tillett, Tracy City, Tenn., lost \$800 by fire June 9. U. S. Dental Parlors, New Orleans, La., were burned out

June 1. H. J. Wetmore had his office considerably damaged by smoke and water at Wymore, Neb., during the progress of a fire May 22.

DIED HARD.—"Ah, yes," sighed the fat lady, "my husband died hard." "Poor fellow," said the woman who is always sympathizing with people; "what was the trouble with him?" "I don't know the scientific name for it. He was the ossified man."—*Ex.*

CIGAR CLIPPERS CAUSE INFECTION.—The Chicago Board of Health pronounces the mechanical cigar clippers used in cigar stores a menace to health. Usually a smoker wets the ends of his cigar in his mouth before inserting it in the clipping machine, and so leaves whatever pathogenic germs his mouth may convey to infect the next comer. Venereal disease is of course the most serious peril, and undoubtedly many cases of extragenital syphilis have originated in this way. Smokers would better employ the clipper which nature has furnished them.

FATALITIES.—A prominent citizen of Jacksonville, Fla., died May 21, 1902, from blood-poisoning following an operation which was rendered necessary by the fact that he had swallowed his set of false teeth. On May 15, a young woman at Sandusky, O., almost died from the effects of cocaine locally applied for tooth extraction by a dentist. A woman at Little Falls, N. Y., 35 years years old, died under chloroform on June 14, after the extraction of fifteen teeth. A woman died from the administration of gas June 9, in a dental parlor in Chicago. A young man, 25 years old, died at Quebec May 28, from the effects of chloroform given for tooth extraction.

DENTAL COLLEGE COMMENCEMENTS.—Colorado College of Dental Surgery, Denver, Col., May 19, 24 graduates. Detroit College of Medicine, Dental Department, Detroit, Mich., June 12, 40 graduates. Georgetown University, Dental Department, Washington, D. C., May 29, 8 graduates. Medico-Chirurgical College, Dental Department, Philadelphia, May 24, 32 graduates. University of Southern California. College of Dentistry, Los Angeles, Cal., June 12, 18 graduates. University of Minnesota, Dental Department, Minneapolis, Minn., June 5, 30 graduates. Western Dental College, Kansas City, Mo., April 30, 66 graduates. Western Reserve University, Dental Department, Cleveland, O., June 12, 31 graduates.

WHITENING OF HAIR.—After reporting a case in which the hair turned white in four or five weeks in a paranoiac, Jones discusses the condition and gives statistics as to his observations in regard to the color of the hair in patients at the Claybury Asylum, and correlates the different types with different emotional conditions. He found light-haired persons were fond of amusement, while the dark-haired ones took more kindly to religious services. He thinks that whatever explanation is offered for the sudden blanching of the hair, which undoubtedly occasionally occurs, the close physiologic connection between the cerebrospinal axis and the skin, which have a common genealogy, must be borne in mind.—*Lancet.*

FALSE MODESTY. The proprietor of of a Spanish newspaper recently received the sum of \$15 from an anonymous subscriber who said he had de-

frauded the paper of that amount, it being the price of over seven years subscription. The pleased editor begs that. "As such conduct ennobles rather than debases, the sender may make himself known in order that he may be praised for the nobility of his act." If any of the subscribers to the *DIGEST* are refraining from settling up old subscription accounts through fear that we would publicly "praise the nobility of the act" if they should remit, we assure them that their names will not be published unless so desired. You can never tell how much latent modesty there is in a man.

COFFEE AFTER DINNER.—It is difficult to give an adequate reason for this practice. One explanation is that coffee tends to neutralize the effect of alcohol which may have been consumed. The practice of taking cheese at the close of a meal is justified on the ground that it aids the secretion of gastric juice and thus favors digestion. This is probably correct, for a morsel of old cheese causes an increased flow both of saliva and of gastric juice. But the coffee question can hardly be solved on a like basis. Instead of favoring digestion, both tea and coffee retard it. Sir William Roberts questions whether this delaying effect on digestion may not after all be a beneficial feature. He argues that the perfection of cooking tends to present us with our food in a condition which favors not merely rapid digestion but too quick assimilation.—*Phila. Med. Jour.*

SUBSCRIBERS APPRECIATIVE.—It is perhaps known to you that we recently sent out bills to all subscribers who were in arrears. The majority paid up and accompanied their remittances with kindly words of commendation. As this issue of the *DIGEST* goes to a large number of men who have perhaps never seen it before, we trust our regular readers will pardon us for reproducing same, as we would like to show how the *DIGEST* is regarded by its subscribers. "We ought all feel under obligation for your persistent efforts in making the *DIGEST* the periodical it is.—Dr. H. L. Gilmour, Philadelphia. Thank you for the many good things I have had through the *DIGEST*.—H. L. Madison, Burlington, Ia.—Simply neglect; *DIGEST* well worth the money. R. W. Hutchinson, New York. Accept our thanks for such a good and wide-awake journal—Hunter & Hunter, Fayetteville, N. C. It is a privilege to support your excellent journal.—Chas. Southwell, Milwaukee."

ARCHITE CEMENT SOLUBLE.—Dr. Frank L. Platt, editor of the *Pacific Dental Gazette* gave the result of personal experiment with Archite Cement before the March meeting of the San Francisco Dental Association. He said, "A new filling material has recently been given to the profession under the name of Archite Cement, for which unusual claims have been made by its manufacturers, especial attention being called to its *insolubility* in lactic acid and ammonia. Experiments made with the sample of hardened cement received from the manufacturers prove it to be quite soluble in lactic acid, one per cent solution, and sparingly soluble in ammonia solution of the same strength, the ammonia so softening the outer surface of the piece of cement tested that it could be readily scraped off with the finger nail. Good authorities also report the cement to be quite soluble in water. So much for another *insoluble* cement."

MARRIED.—L. G. Albright-Marie Paterson, May 27, Chicago. Carl Blair, Youngstown, O., May 28. R. K. Davis-Janet Osborne, May 12, Allison, Ia. G. T. Earhart-Nona McCormick, May 28, Indianapolis. R. E. Flory-Sarah E. Scott, June 10, Dayton, O. E. G. Gibson-Miss Davey, June 12, Momence, Ill. G. Hinds-Carrie Staats, June 2, Bozeman, Mont. R. A. Morton-Edith Tate, June 4, Shelby, Ia. W. C. McConnell-Mattie Carrick, June 4, Fenton, Mich. A. B. MacEachern-Jennie Hamilton, June 4, Detroit Mich. H. McNeil-Emma Bunnell, May 16, Chicago. L. A. Riley-Louise Mathers, May 24, Seymour, Ind. F. C. Runge, Jr.-Harriet Ruelle, May 19, Houghton, Mich. G. A. Ryder-Mame Rossley, May 8, Lawler, Ia. E. G. Schmidt-Rose Benner, June 4, East St. Louis, Ill. J. A. Stoeckley-Emelyn M. Hinkle, June 18, South Bend, Ind. W. A. Thornton-Irma R. Hobbs, June 11, Marianna, Ark. E. H. Weber-Clara Libenstein, May 14, Lake Mills, Wis.

DENTIST'S QUEER WILL.—There is a queer old traveling dentist in New Mexico who spends his time pulling cowboys' teeth and collecting curios. He is from Michigan and has a strong affection for the University at Ann Arbor, to which he has frequently presented pottery, mummies and relics of the cliff dwellers. He has accumulated a handsome fortune and, being advanced in years, has recently made his will, which he sent to the University. He has bequeathed to the University his entire fortune, his collection of curiosities, and the large tent in which he lives and practices. His only stipulation is that an annual festival in his memory must be held in the tent, at which the leading features of the menu shall be "large cold bottles and small hot birds." The feast is not for the students, but for the faculty and president, and while they would like the curios and the money, they are unplussed by the annual carousal.

DENTISTRY NOT LIBERAL.—"You pride yourself on being a member of a liberal profession," said a medical man to a dentist friend, "but you are completely off. You see, it's like this: When you do anything you know beforehand just what's going to happen, and it happens just as you had foreseen. Now, with us it's different. When we shoot a pill or blow a powder into a patient we simply don't know—we think—we guess. Of course something happens, but just what don't appear until later—sometimes too later. Therefore your so-called profession is at best an art and you an artist—perhaps merely an artisan; while I, *directly as I don't know*, am a professional man." "Yes, but how about the lawyer and our clerical friends?" "Why inasmuch as their ability to foretell is even inferior to mine, they're that much more professional. The fact is, the more you know the less you have to profess, and this looking wise twenty-four hours a day undermines one's health."

BRAZIL HARD ON DENTISTS.—Under date of Feb. 1, 1902, consul Kenneday writes from Para: "There is a federal statute in Brazil which provides that all physicians, surgeons, and dentists of foreign extraction who desire to practice their profession in any part of the country must first pass a prescribed examination at the medical colleges at Bahia and Rio Janeiro. These examinations, which include languages and other branches not usually found

in a medical curriculum, are said to be so severe that few foreigners have any chance of passing them successfully. It is now reported that this law is to be more rigidly enforced hereafter, especially in the case of dentists. There are several American dentists in Para who have been practicing here for years. They may now be required to go to Rio de Janeiro and take examinations, and in case of failure they will be compelled to give up their profession or leave the country. Although this is a very profitable field for medical practitioners, it should be remembered that the examinations are so severe as to necessitate two or three years extra preparation."

RIVALRY.—First oldest inhabitant—"I won't stand it. I'm older'n you, an' you know it. W'y look at my mouth. I ain't got a sound lower tooth



in my head." Second oldest ditto—"Look in yer mouth? He, he! W'y gum it, you had a dentist pull those teeth out an' he'll swear that you hain't paid him yet."—*Chicago News*.

EXAMINING BOARD AFFAIRS.—Two members of the Wisconsin State Board of Dental Examiners have resigned because the governor deposed without warning another member during the progress of an examination. The Missouri State Board of Dental Examiners met at Jefferson City May 19. Two out of seven applicants passed the examination and were registered. The next meeting will be held the first Tuesday in October. The governor of Ohio has appointed the following State Board of Dental Examiners, under the new law mentioned in last month's DIGEST: H. C. Brown, J. K. Douglas, L. L. Barber, H. Barnes, S. Smith. We announced last month that the dentists of South Dakota had attacked the constitutionality of the law requiring each practitioner to pay an annual registration fee of \$2, and on May 13 a judge in the circuit court declared this provision of the law unconstitutional. As the payment of the fee is necessary to sustain the expenses incurred by the requirements of the law, the whole law would seem to be affected.

SPEED OF WINK.—A German professor, by means of a photographic apparatus, has measured the amount of time consumed by the eyelid in the act of winking. His investigations proved that the eyelid descends more quickly than it rises, and that an appreciable pause takes place when the lid had descended. The measurements, obtained by a special photographic apparatus, are as follows: Downward movement from .075 to .091 of a second; the pause is from .15 to .17 of a second, while the rising of the lid takes about .17 of a second, the wink being completed in about .4 of a second. —*Jeweler's Review.*

MARK TWAIN ON BAD HABITS.—"Bad habits, according to Mark Twain, are very good and helpful things for a man to have," said a Philadelphia editor. "The first time I interviewed Mark I was smoking a cigaret, and I apologized for this. 'It's a bad habit, I know, sir,' I said humbly. 'Why, that's all right,' said Twain; 'I like to see young men have bad habits. I like to see them stir around and accumulate all of them they can. A man is like a balloon, and his bad habits are his ballast. Now, suppose he's taken suddenly down sick. He throws off some ballast—throws off, we'll say, the habit of smoking—and in a little while he's up and about again. But if he's very sick, and the throwing off of smoking doesn't bring him around, he gets rid of more ballast—gets rid, say, of the booze habit—and if even then he isn't cured he must throw off still more ballast; so that you can see easily enough what a fine thing it is for his health to have as many bad habits as possible. But if he has no bad habits and is taken sick, not being equipped with any ballast to throw off, the chances are that the unfortunate fellow will die.'"

ROBBERIES—May 12 three dentists at Santa Ana, Cal., lost respectively \$200, \$40 and \$20, all three jobs apparently having been done by the same thief. May 26 two offices at Trinidad, Col., were robbed of \$115 and \$35 respectively. June 2 two dentists at Colorado Springs lost \$10 and \$50 respectively. Robberies are reported from Las Vegas and Raton, N. M. A dentist in New Haven, Conn., lost \$60 some weeks ago, and recently two more offices in that town were entered by burglars, in one instance getting \$50 worth of material and in the other case being frightened off. A dentist at Louisville lost \$100 worth of stuff last month, and the thief was caught a few days later while trying to dispose of it. June 12 a dentist at Adrian, Mich., lost about \$75 through thievery, and the next day a dentist at Port Huron was victimized. The safe of two dentists at Fayetteville, N. C., was looted of \$50 in cash on May 28 by their office boy, who was arrested two days later. It is reported that last month several offices in Newcastle, Pa., were robbed by thieves. A dentist in Milwaukee was robbed last month, but the burglar was arrested while trying to dispose of the loot. A dentist in New York warns the profession to look out for a smooth young man who, passing as a patient recommended by some physician, asks to have his teeth examined, and then steals whatever he can while the dentist is called out of the office by a confederate. In view of these reports which the DIGEST has been publishing for several months, the profession throughout the country would do well to protect itself from similar depredations.

HUMAN MILK, A NEW REACTION.—Moro (*Wein. Klin. Woch.*, Jan. 30, 1902.)
 —When a few drops of human milk are added to fluid obtained from a hydrocele this latter fluid will coagulate to a firm mass in a few minutes. This does not happen if cow's milk is used. This reaction occurs with human milk even when heated and therefore must exclude the action by ferment. He was unable to determine the factors engaged in this peculiar phenomenon.

UNBREAKABLE GLASS.—The *Journal d'Hygiene* publishes a description of the unbreakable glass made by compressing ordinary devitrified glass, and its advantages for clinics, hospitals, etc. It makes the best material for floors, wall coverings, ceilings, etc., as it is not affected by the copious use of water and disinfectants nor by the most powerful acids, nor by freezing. It is used extensively at Reverdin's polyclinic at Geneva and in establishments where acids are employed in manufacturing. Recent tests at the French Laboratory of Bridges and Highways proved that a force of 2028 kilograms to the square centimeter was required to crush it, while granite can be crushed with 650 kilograms. Tests with a rapidly revolving grindstone showed that it resisted wear better than Saint Raphael porphyry and other extremely durable stones. It also surpassed other materials used in floors and pavements in its resistance to weights falling on it.

TO ENCOURAGE CHEERFULNESS.—The fame of the poem of Ella Wheeler Wilcox "Laugh and the World Laughs with you, Weep and you Weep Alone," has brought forth a parody by Dr. J. W. Chamberlain of St. Paul, published in a current number of the *Medical Mirror*:

Knock, and the world knocks with you;
 Boost and you boost alone;
 This bad old earth is a foe to mirth,
 And has a hammer as large as your own.
 Buy, and the gang will answer;
 "Sponge," and they stand and sneer;
 The revellers bound to a joyful sound,
 But shrink from refusing beer.
 Be rich, and men will seek you;
 Poor, and they turn and go.
 You're a mighty good fellow when you are mellow
 And your pockets are lined with "dough."
 Be "flush," and your friends are many;
 Go broke, and they "lose" you—all;
 You're a dead game sport at \$4 a quart,
 But woe if you chance to fall.
 Praise, and the cheers are many;
 "Beef," and the world goes by;
 Be smooth and slick and the gang will stick
 As close as a hungry fly.
 There is always a crowd to help you
 A copious draught to drain;
 When the jag is done you must bear alone
 The harrowing throbs of pain.

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Original Contributions.

AN ORIGINAL SYSTEM OF TIGHTENING LOOSE LOWER INCISORS AND CUSPIDS, EMBRACING A METHOD OF SECURING SUBSTITUTES WITHOUT CLASPS OR PLATES, WHEN THESE TEETH ARE MISSING; TOGETHER WITH A DISCUSSION OF THE QUESTION OF PULP DEVITALIZATION— WHEN AND HOW—IN SOUND TEETH.

BY D. D. SMITH, D.D.S., PHILADELPHIA. READ BEFORE THE NEW YORK
ODONTOLOGICAL SOCIETY, FEB. 18, 1902; ALSO BEFORE THE CINCINNATI
ODONTOLOGICAL SOCIETY, MARCH 19, 1902.

The subject matter of this paper is the outgrowth of many and varied attempts to relieve a class of patients who in considerable numbers are the helpless subjects of destructive agencies, the work of which is most marked in connection with the lower incisors. The almost universal presence of irritants on the lingual surfaces of the roots of these teeth, causing absorption of the alveolar tissue and consequent loosening of the teeth, is due first, to ignorance, inattention and neglect on the part of the patient; and secondly, to the insufficiency of present methods in dental practice.

However unfortunate and humiliating it may be for the profession, it must nevertheless be admitted that a true statement regarding existing conditions would reveal the fact that it is not neglect alone on the part of the dentist, but that dentistry itself, as now understood and practiced, is wholly incompetent to cope with the progressive absorption found in connection with these teeth. Hence the destructive process goes on to loosening, and from loosening to entire loss of the teeth.

If there are those who apprehend the true cause of these untoward conditions, no treatment worthy of note has yet been made known

as preventive; little or nothing creditable has been done in the way of relief, and we fail to note a suggestion even looking to cure. The trend of dental thought has been so conservatively directed in the past, and the importance of pulp conservation has been so unduly magnified, that we have overlooked important means for the permanent preservation of these teeth, and we have failed entirely in devices and appliances, easily available for relief, when permitted the use of teeth deprived of living pulps. The crude mechanical attempts which have been made with strings and wire in an effort to stay this loosening have contributed greatly to the general infection of the mouth, and served to hasten the inevitable issue.

It is the purpose of this paper to present for your consideration a system for the permanent tightening of loose lower front teeth; a system which is equally applicable for inserting artificial substitutes on the lower jaw, where front teeth only are missing. I have chosen the term system rather than process in this connection because each case requires a regularly formulated plan, and because there are special operations and special mechanical processes, so connected and interwoven as to make one complex whole.

The inception of this system is one of the results of breaking away years ago from the commonly accepted teachings regarding the dental pulp. I am free to say no man can apprehend the highest service in practice until much of the past and present teaching respecting the offices of the dental pulp are overthrown, and the pulp itself is made to appear not as on masquerade, but in its true character, performing its work as a *part* of the vital forces of the tooth.

While it is not my purpose to surreptitiously advocate the wholesale destruction of dental pulps without cause, it should here be stated that this system of tightening loose teeth *requires* the destruction of normal pulps in strong, sound well developed teeth.

I hope to make plain a good and sufficient reason for lifting the ban of conservatism off such teeth as we may desire to use in this operation. If permitted to extend the discussion into other fields I should include such other pulps as we may know to be playing a mischievous part in the work of pyorrhea, and others that through misdirected activity in nutrition are helping to reduce the vascularity of the cemental tissue on the roots of many good strong teeth, thus hastening through absorption their permanent separation from

the alveolus. I should also unqualifiedly recommend pulp removal before filling in all cases of true pulp exposure. Indeed, I should take that rational view of a tooth which separates it into two parts—a crown and a root, each with its own independent source of life and nutrition; the crown-life supplied wholly by the pulp, from its chamber within the body of the tooth; the root-life supplied wholly from tissues and vessels in communication with the pericemental membrane, external to the root. I regard the crown-life, when once the tooth is erupted and consolidation of enamel and dentin is completed, as neither sacred nor inviolate; it may cease, as it frequently does in the course of nature, or it may be determined by external violence, without palpable injury to either the texture or function of the tooth. Pericemental or root life, on the contrary, I would impress as the *all important* life. Root life is sacred and should never be encroached upon in violence, to do this is to endanger the tooth.

It may seem a radical statement, but I am impelled to say that to hold to the estimate ultraconservatism places upon the dental pulp in the fully developed tooth is to fail to appreciate, and consequently fail to utilize many opportunities for service and usefulness in dental practice. As the destruction and removal of pulps from sound teeth are the basis of this system of tightening and inserting, any discussion of it to be complete must include means and methods for pulp devitalization, as well as the surgical aftertreatment of the roots. The latter is a matter of vital importance, involving the conservation of the cemental and pericemental life of the root, and as a consequence the stability, comfort, and permanency of all pulpless teeth.

Perhaps no subjects in the whole range of dental practice have been more prolific of discussion than those of pulp destruction and the aftertreatment of roots. Let us then study them with such care that no misinterpretation either of terms, means or methods shall result. Turning first to the living pulp, its work, as builder and nourisher of dentin (whether of root or crown) and of all enamel, is beyond dispute or question. The pulp is the only source of nutrition or sensation distributed to dentin or enamel in any part of the tooth; it also binds the dentin and enamel into sentient and nutritive agreement, through that vital force we call life.

Withdrawal or cessation of pulp-life from a tooth means complete cessation of nutritive function and sensation from all dentin and all enamel, as well as the complete loss of that vital force, uncompre-

hended but plainly manifest in a tooth with a living pulp. The effect of pulp destruction upon the enamel and dentin as tissues is inconsequential, if not in most cases imperceptible, but the crown as a coherent body is diminished in strength by it. This, however, is not a matter for serious consideration, as the sustaining strength of a natural crown is usually many times that of the strain ordinarily put upon it; very few pulpless teeth are broken or split by a force which a vital tooth in a similar state would sustain without injury. The destruction of a pulp in a young tooth, as in a patient 10 or 15 years of age, means, generally speaking, a retrograde metamorphosis for the osseous tissues of that crown, which may in the lapse of years materially weaken it, but its utility or efficiency is by no means impaired thereby.

Pulp destruction in more mature teeth, as at puberty, and from then to the verge of old age, exhibits little harmful effect, even upon the coherent strength of the crown. A tooth deprived of its pulp during this period, if properly treated, will perform all tooth-functions with the same fidelity, and often with greater comfort, than the tooth with a vital pulp. The harm that comes to the crown is slight, and not of a character to warrant any unfavorable prognosis.

Let us now inquire as to the root, that vital living part of the tooth, retaining and exercising all of its functions as when the pulp distributed sensation and nutrition to the dentin and enamel. It is my firm conviction, based on an extended experience, that there is not only no injury to the root in a wisely directed devitalization, but that there is often considerable gain. The permanent saving of a pulpless tooth rests upon the fact that there is a source of nutrition to the cementum, maintained independently of pulp action, and that this nutrition of the root is wholly unaffected by pulp destruction. The cementum, with its membrane the pericementum, is the most important tissue of the tooth for conservation; hence the peculiar emphasis attaching to the fact that physiologically the cementum receives its life and nutrition from a source wholly independent of the pulp and that it is unaffected by devitalization of pulp tissue. Articulation with alveolus, the most important of the tooth's relations, is unaltered and unaffected by pulp destruction, and cemental nutrition and absorption are not interfered with by it.

Pulp endowment to a tooth, in so far as it affects harmonious

union between root and alveolus, after tooth eruption, might be discarded without detriment; for the root portion of the tooth, in connection with its pericementum, is an independent vital organ, retaining and exercising function the same as when the pulp distributed nutrition and sensation to the dentin and enamel of the crown.

There are no necessary untoward cemental or pericemental symptoms, nor any change in the work of these tissues following the removal of the pulp, hence this operation, accompanied with proper disinfection of the tubules and of the intertubular matter, necessarily implies uninterrupted normal function of the tissues which furnish vital attachment between root and alveolus.

Pulpless teeth when properly treated are wholly comfortable—not weather indicators, not erratically subject to periodontitis, alveolar abscess, or other pathological conditions, but teeth with a favorable prognosis in all particulars.

Pulpless young teeth, that is, teeth which have lost their pulps before the vascularity of the cementum has been restricted by the contraction of its lacunæ and canaliculi through deposits in its substance, are far more subject to cemental accretions, or so-called exostosis, than the same teeth with living pulps. This is by no means an unfavorable condition, as through it the territory of normal circulation of cemental tissue is increased to the benefit of the tooth.

A noticeably frequent result of pulp destruction is a closer, firmer union of root and alveolus. This is probably due to two causes: first, an increased tendency to a deposit of cemental tissue on the surface of the root, and second, the entire obliteration of calcific deposits in cementum through pulp influence. A pulpless tooth which has never been the subject of pyorrhea alveolaris is practically if not entirely exempt from that trouble, and devitalization and removal of the pulp in the beginning of the disease is in individual instances attended with most satisfactory results.

Further, the value of a pulpless tooth should not be estimated from the condition of the natural crown, as it, with present methods for permanent crown restoration, is the least important part of the tooth. The root and its surroundings, that upon which the permanent comfort and retention of the tooth depends, should always form the basis of judgment and diagnosis. If the root portion of the tooth is firmly in vital union with the alveolus, and without pyorrhætic tendencies, the condition of the crown, whether much decayed

or broken, or even wholly gone, is not a matter affecting the possibilities of restoration in the smallest degree. A crown having the appearance of the natural tooth, and practically indestructible, can be supplied on any good root and on very many badly broken ones in any part of the mouth. The root which has an uninjured pericemental connection never questions whether the crown it is supporting is natural or artificial, but performs all the functions of a tooth with uncomplaining fidelity. We therefore conclude that the pulpless tooth with or without a crown is a living organ of the economy, and that it is to be esteemed and treated as such.

Thus we see that a true physiological differentiation of pulp and pericemental activities compels abandonment of many old and literally worn-out theories respecting pulp utility and pulp destruction, and the adoption of views and teachings which harmonize with common sense, physiological action and experience in practice. Finally, we may reckon ourselves well within the bounds of professional service when we study as I now propose,

Methods of Pulp Destruction.—A recent paper on this subject in the *Stomatologist* would be passed without comment, but that that journal is the organ of one of our larger colleges, and the article from the pen of one of its teachers. We thus judge that it fairly exhibits what students of dentistry of the present time are receiving on the important subject of pulp devitalization. We can but wonder if the general level of teaching in our modern schools is on a plane with the article referred to; if so, we think it must be admitted that the strictures of Dr. Wood, a professor in a medical school with a dental department, who publicly proclaimed that "the 'D.D.S.' is a badge of partial culture," are wholly just.

The author of the paper referred to, Dr. Inglis, says, "When the pulp is exposed and its extirpation is necessary there are several methods of preparing it for removal. These are briefly—devitalization by arsenic; benumbing by cocain, cataphoresis, or pressure anesthesia; and lastly, immediate removal by the shock of a wooden splint rapidly driven into the pulp." I have quoted all that is said in relation to the three methods in review, "the advantages and disadvantages of which he has sought to compare."

While much might be said of his teaching respecting "devitalization by arsenic and benumbing by cocain cataphoresis," what stamps

itself as most impressive in this article is "the *immediate removal* by the shock of a wooden splint rapidly driven into the pulp."

It would be entertaining if not instructive to know just when, how, and under what conditions this refined operation is to be performed. It would, I am sure, be instructive to know just how this method *removes* the pulp from the tooth. Then, too, recital of some personal experiences, together with statistics respecting the success of this operation, not forgetting definite instructions as to which end—the apical or crown—the wooden splint should be rapidly driven in at, would add to our present limited knowledge of the subject. To the uninitiated it would appear difficult, even when access to cavity is most favorable, to rapidly drive a wooden splint through the small pin-head opening usually found in the ordinary exposure to the very end of even a single-rooted tooth, not to mention the teeth known and unknown with bifurcated roots, and the known two and three-rooted teeth. We are informed further on in the article that "the shock of a tapering wood point rapidly driven into a pulp seems to cause but little pain if the operation is neatly done in a single-rooted tooth. A free exposure must be had so that the point may reach nearly to the apex."

If we are left somewhat in doubt in regard to the splint, we are fully informed respecting the arrest of hemorrhage, which the author says may be considerable from the apical arteries. "The most active agent for this purpose is a saturated solution of zinc chlorid in water (deliquesced zinc chlorid)." Imagine the effect upon a highly nervous organization—first, of driving a wooden splint into a living pulp, and then of the attempt to arrest an apical hemorrhage by the introduction of deliquesced zinc chlorid into a tooth-root, following the removal of a freshly devitalized pulp. Deliquesced zinc chlorid, one of the most highly irritating of dental medicaments, in no sense a styptic, introduced into a root immediately following pulp removal!

These quotations from this recent article are but samples of the incongruous absurdities put forth as the teachings of dentistry to-day, and that from professional sources.

It is not my purpose, even if I had the time, to discuss the so-called "instantaneous method of cocain benumbing, or devitalization under pressure," as it is not applicable in cases of sound teeth, such as we are generally required to deal with in connection with the system of tightening under consideration.

Hence we turn to devitalization by arsenic—the oldest, surest, most convenient and only strictly painless method yet known. Perhaps no agent in the dental pharmacopeia has been the subject of more false theories or of more unreasonable prejudice than arsenic as a devitalizer. Many attempts have been made to revise and improve the original formula, but nothing better nor more convenient of application has ever been produced than the old preparation of Dr. Spooner, sold under the name of "Nerve Paste." It consists of equal parts of arsenic and morph. acetate, made into a thick paste with creosote for convenience of handling. The morphin was introduced originally to counteract the pain excited by the application, but in reality it is only an excipient, its pain-reducing qualities not being appreciable. The action of creosote in a tooth is always good, and for that reason it should hold its place in the mixture, but the one active agent in the work of devitalization is the arsenic.

To attempt a review of the theories of its action, mischievous and otherwise, or to revive the opinions and prejudices which have appeared as teachings in relation to it in the last thirty years, would add little to our information, and nothing at all to the literature of the subject. My main purpose in dealing with it is to start an old, familiar remedy on a new and enlarged mission for the relief of suffering. To speak of arsenical devitalization as "the only strictly painless method yet made known," may sound strangely weird and altogether hypothetical to those who have endured hours of suffering induced by an arsenical application to highly sensitive, irritated or inflamed pulp tissue; nevertheless, there are methods of use for this agent which render it perfectly tractable and which fully justify the use of the expression, "strictly painless method."

And it is not only painless, but it is effective, certain. Dr. Inglis in the article alluded to continues to exploit the old idea that "there are patients of the type to resist arsenic," but teachings in harmony with the unhindered action of this substance in a tooth show the living tooth-pulp to be perfectly helpless in the presence of this irresistible destroyer of life. There are no conditions of the teeth which in any true sense are even suggestive of "patients of a type to resist arsenic." But some one may say, why such strong statements? "Have I not made applications of arsenic to pulps, causing intense suffering and yet without destroying them?" Yes, undoubtedly, and the writer is not without similar experience.

The crimes committed against the dental pulp I am glad to believe have been crimes of ignorance, but as Paul said to the erudite Athenians who had dedicated a religious altar to the "Unknown God," "The times of this ignorance God winked at, but now commandeth all men everywhere to repent."

The grasping of truth along new lines of thought, or the making of new applications of old truths, is often a slow and tedious process; and how often we fail to benefit by truth which is plain and easy of interpretation if we would but reason and investigate. When I first went to Philadelphia to attend the P. D. C., there were two men in the profession whose names were as household words to the readers of the dental literature of that time. These men, with almost a national reputation, were without the respect of their confreres at home. Possibly there may have been other reasons for this, but they were justly held in contempt for the unwarranted and reckless use made of arsenic for the relief of pain in excavating sensitive dentin. Hundreds of mouths suffered the tortures of periodontitis and alveolar abscess at the hands of these men, and thousands of teeth were hopelessly discolored through pulp decomposition, for lack of removal and treatment. The arsenic used was for obtunding sensitive dentin; it was minute in quantity and perfectly painless in action, but very, very certain in its results. The sensitiveness of the dentin was fully relieved, and *the pulp always died*. Beyond this no one seemed to care to investigate.

The applications afforded entire relief from the pain of excavating, but this use of arsenic—its application for sensitive dentin—*destroyed pulps*, and eventually discolored teeth and caused abscesses, and these evil consequences aroused the condemnation of the whole profession, and very naturally voices from all quarters were raised against this abusive use of arsenic; and this was well. The better practitioners were so intent upon the suppression of this evil that they failed entirely to grasp the important lesson which it taught, and so it became thoroughly instilled into the minds of the profession, that to destroy a pulp with arsenic the application must be made directly to the pulp tissue, and present practice is in entire accord with it. Great emphasis was given to the teaching that it must *not* be applied to dentin, because if so applied it would surely kill the pulp, and these paradoxical theories have confronted the profession for more than forty years.

In November, 1900, several professors in dental colleges and prominent practitioners of Philadelphia honored me in accepting an invitation to witness in my office some results of the oral prophylaxis treatment. Incidentally there was exhibited a case of tightening loose lower front teeth, illustrating the system under consideration. Here, before these gentlemen, for the first time public advocacy was made of the method of pulp destruction through an application of arsenic to vital dentin.

That I may not be misunderstood at this point, I desire to introduce a letter from Dr. J. Foster Flagg, written in November, 1900, in answer to certain inquiries by Dr. Louis Jack, relating to this subject. Dr. Flagg says:

It is nearly forty years since I have taught in lectures the drilling into teeth, not at an "indifferent" point, but accurately at a point which after pulp devitalization would, by enlarging, permit more facile and complete extirpation. This drilling was for the purpose of making an arsenious application, thus permitting obtunding applications in cavities either dangerous from proximity to gum, or "so situated that full and free ingress to the pulp cavity would be difficult." My papers in *Cosmos* were begun in March, 1872, and were all written from notes of several courses of lectures previously given. On p. 61, *Cosmos*, Feb., 1877, you will read, "We employ the arsenical paste so soon as we have obtained a drill-pit of sufficient depth to permit the secure retention of the medicament." As I had given this as practice long before 1872, in fact, from the time I began lecturing in the P. D. C. in 1863, you will see that it must be at least forty years old. At first I called these "drill-pits," but eventually gave them the name of "pockets," which they were until the perforation into the pulp cavity had been obtained. If you have a copy of Inglis' "Questions and Answers," published twelve years ago, you will find all this definitely put in question 471.

To fully understand what impression Dr. Flagg's claimed teachings of forty years made upon his colaborer, Dr. Inglis, I quote a single paragraph from Dr. Inglis' most recent article. He says: "In case of pathology of the pulp, hyperemia, inflammation, etc., pressure anesthesia cautiously used offers a means of entering the pulp bulb and depleting it of its excess of blood, so that arsenic may be applied with a fair chance of successful devitalization." Here we have clearly set forth in the latest teachings of Dr. Inglis the fact that the application is not only to be made to the pulp, but that the pulp-bulb is first to be depleted, "that there may be a fair chance of devitalization." Surely there could be no plainer

evidence that Dr. Inglis understood Dr. Flagg as advocating contact of arsenic and pulp tissue to insure devitalization. If arsenic is or has been used after other methods than applying directly to the pulp, for pulp destruction, it has been in exceptional cases and because location of cavity favored escape of arsenic to the injury of adjacent parts.

Dr. Jack in a letter to the author under date of November 20, 1900, writes "Your plan of devitalization of pulp was, while not a new statement, a striking one and I shall put it in practice. The violent congestions which have often occurred when arsenic was used as an obtrudent of dentin, inhibited me from using it in the manner you pursue."

Dr. Inglis in the article quoted from further says, "Immediate removal is eminently desirable in order to avoid possible suffusion of the crown and possible delays in the action of arsenic." Here again we see complete misapprehension of the behavior and effects of arsenic when in contact with tooth tissue. Instead of "possible delays" if properly applied, it accomplishes the work of devitalization with promptness and certainty. Instead of "violent congestions" (Jack) or "possible suffusion of crown" (Inglis) devitalization proceeds quietly without congestion or pain and with no suffusion or injury to the crown.

A long-neglected application, especially in connection with young unconsolidated dentin, would naturally be the subject of engorgement of tubules or possible suffusion of the crown; but this is a wholly unnecessary concomitant. No application should be allowed to remain in the teeth over forty-eight to seventy-two hours; in general terms forty-eight hours is the limit. In upper molars the time may be extended to seventy-two hours, while in many cases of small single-rooted teeth, as upper laterals and lower front teeth, removal of pulp tissue may be effected after twenty-four hours. In cases of young unconsolidated anterior teeth, where danger of discoloration is imminent, no arsenical application should be allowed to remain over twenty to twenty-four hours.

That pulps would die from the effects of an arsenical application to dentin may have been known from the days of Dr. Spooner—the first to suggest the use of arsenic for devitalization—and Dr. Flagg may have taught the making of applications in drill-pits or pockets forty years ago: (what he really claims is, that "the drilling was

for the purpose of making an arsenious application in cavities either dangerous from proximity to gum or so situated that full and free ingress to the pulp cavity would be difficult,") but I submit if Dr. Flagg or any one else has ever advocated or taught the application of arsenic systematically to *vital sensitive dentin, with the purpose of devitalizing the pulp*. If Dr. Flagg has taught this, his intimate associates, his pupils and the profession at large have failed to understand him, and his teachings have consequently made no impression. The teachings of the profession have been and still are that the application for devitalization must be made directly to pulp tissue. In sharp contrast to this, my teaching is that that the arsenic *should never be applied directly to pulp tissue, but always to vital, responsively-sensitive dentin*.

This unique and most important method of devitalization should be known, that patients may be permitted to share in its benefits. Arsenical pulp devitalization can be accomplished for all teeth quickly, with absolute certainty, without exciting pain in the tooth, with no injury to pericementum or other parts—the application always being made to intermediary, vital, sensitive dentin, but in no instance should it come directly in contact with pulp tissue. In this method all the hitherto prohibitive or objectionable features of arsenical devitalization are removed and there is presented a perfectly safe, certain and painless mode, as comforting to the patient as it is satisfactory to the operator.

The three most important objections under old methods may be enumerated as follows: 1st. Danger of escape of the arsenic through or around the confining medium to the gum and adjacent tissue. (Failure to absolutely confine the arsenic in the cavity has been the cause of much serious poisoning of mucous membrane, gum and alveolar tissue, often resulting in necrosis, exfoliation of alveolus, and loss of the tooth.) 2d. Failure of toxic principle to act upon the pulp, through what has been regarded and defined as "patients of a type to resist arsenic." 3d. The unavoidable, often intense pain, following an application to the pulp at the point of exposure.

It should be emphasized that every arsenical application must be securely confined in contact with vital, responsively-sensitive dentin. The old methods of using cotton, cotton and sandarac, tin foil, or any of the newer cements—the oxyphosphates—should be wholly abandoned, as they are unsatisfactory, unreliable and unsafe. The

one retaining material which has proven wholly satisfactory is a white "temporary stopping." (Gilbert's red stopping is intensely irritating and should never be used in a tooth.) The white temporary stopping may be carried to place under low heat, and if worked in a dry cavity may be made to seal the application perfectly in place, a matter of vital importance.

And now a word in regard to the unsuccessful attempts to induce toxic absorption which have given the impression that there are pulps which cannot be influenced because of "patients of a type to resist arsenic." Investigation will show such cases to be in connection with vigorous, active pulps in strong, dense teeth. Arsenic, itself a powerful escharotic, acting on pulp tissue at the point of contact with the pulp, causes rapid surface engorgement and almost instantaneous paralyzation of the superficial vessels. An intermediary protective film thrown out by exosmosis is thus formed at the point of contact, interposing an effectual, permanent barrier to the arsenic or any toxic influence. The increase of pain in the tooth, practically universal, after these unsuccessful applications is due to the irritation induced by the presence of the escharotic, the protective film, and the intense activity of the pulp in its efforts at self-preservation. Now let an application of arsenic be securely confined in contact with a small section of freshly-cut sensitive dentin in this same painful tooth, and it will be observed that the intensity of the pain will rapidly diminish and the pulp will quietly succumb to the toxic influence of the arsenic acting through the tubules of the intermediary dentin.

In cases of exposed aching pulps no cognizance need be taken of the exposure, or of the disturbed irritated or congested condition of the pulp, as the pain will be quickly relieved by the arsenical application and complete devitalization enforced, if as in other cases, the arsenic is applied in the manner described to vital dentin in a freshly-opened cavity in another part of the tooth, although it be remote from the exposure.

(To be concluded in August Digest.)

HEMORRHAGE—TO ARREST.

BY I. M. FRY, D.D.S., HEBRON, NEB.

I recently extracted some teeth for a patient, and several hours afterwards was called in the night to do something to stop the bleeding. It seemed that the patient had always had trouble of

this kind after extraction of teeth, etc. I took an impression of the mouth in modeling compound, and when cold trimmed it to make an appliance that could be worn in the mouth, notching it to receive a small strong bandage to be tied over the head. I then made a thin batter of plaster, adding a pinch of salt, and filled the appliance, putting it at once into the mouth and pressing it firmly to place. I held it there until the plaster was set, and without removing it the bandage was put in place and tied firmly. The socket had previously been packed with cotton saturated with fluid extract of ergot. This had been sufficient to stop the bleeding for the same patient on two former occasions of similar character. Immediate relief was given in this instance.

FILLING OR CROWN.

BY B. S. HEET, D.D.S., ROCHESTER, N. Y. READ BEFORE THE ROCHESTER DENTAL SOCIETY, JAN. 14, 1902.

Years ago the work of the majority of dentists consisted of extracting the natural teeth and replacing them with artificial substitutes. Little attention was given to preservation and countless numbers of teeth were sacrificed that were not decayed in the least, to say nothing of those that although decayed were even in those days saved by the more skillful operators. Most of us can recall some of the old practitioners who did that kind of work, and more or less of the period when it was done, and can appreciate the great change which has taken place in the practice of our profession. Nowadays to retain the natural teeth in comfort during the lifetime of the patient, and to preserve their useful and cosmetic functions to the end, is the goal towards which every effort should be, and in the majority of cases is, directed.

One of the most important aids in carrying out this ideal during the past twenty-five years has been the introduction of crowns of various kinds: but there is danger of their being carried to abuse, and one of the most perplexing questions which confronts the conscientious dentist is that which forms my subject—filling or crown. There is no uniformity in the response, as is evidenced by the fact that sometimes we remove a crown and find that it has been placed over a tooth having only a small cavity; and on the other hand, we frequently see teeth with very little of the natural crown remaining, yet built up with large contour fillings which have done good service for many years.

One important thing to be considered is, whether the pulp is alive or dead, as the crown of a tooth with a live pulp has much greater power of resistance and will endure more strain than a pulpless tooth, and can often be filled with safety, when a pulpless tooth no more decayed would be better crowned. This applies more forcibly to the superior bicuspids, as we have more failures with them from breaking down than with any other teeth. It is with them also that we have the most trouble from recurrence of decay, even after they have been filled with the greatest care. This is discouraging to both patient and operator, and more than one dentist of my acquaintance usually advises a crown when the cavities are at all large, but there is certainly no excuse for such action.

In the case of badly decayed molars our decision should be influenced somewhat by whether or not there are any teeth to occlude, and if not, we should fill instead of crown. In cases of loose roots crowning should be postponed as long as possible, although some teeth of this character which I have crowned have been quite satisfactory, a few of them even improving. When senile decay is reached, and no fillings stop its ravages, we are justified in putting on crowns even when considerable of the natural tooth structure remains. We should always ignore the financial element in determining the question under discussion, and the wishes or advice of the patient should have very little weight. Our rule should be to fill as long as possible and crown only as a last resort.

Discussion. *Dr. Frank French, Rochester:* I presume that there is not a dentist present of five years practice who has not done some work he is ashamed of and which nothing to-day would tempt him to repeat. Seventy-five per cent of the teeth then extracted would be saved to-day, and the most of the crown and bridgework he did then would not be thought of now. Why is it that large crown fillings, also compound and approximal ones, which we could point to with pride twelve or fifteen years ago as having preserved the teeth perfectly for years, are now rarely put in? Is it a lost art, or do our young men think more of their pocket-books than of their profession? It would seem as if the young men in college to-day are not taught to do this kind of work, as it requires skill, judgment and honesty, and very few demonstrators spend much time over it.

When rubber came into use it was thought that because of its

easy manipulation it would be a curse to dentistry, which proved to be the case, for a man with very little mechanical skill could "put up a rubber job," and in many cases it was a put-up job for both dentist and patient. Twenty-five years after this dentistry got another black eye from which it is slowly beginning to recover. I refer, of course, to crown and bridgework. With its advent many dentists sang to themselves that good old Methodist hymn—"This is the way I long have sought and mourned because I found it not." What was the result? From the mistress in the parlor to the maid in the kitchen, and from the merchant in his office to the porter in the warehouse, came the fitful gleam of gold whenever their mouths were opened. Thousands of good teeth were cut off and replaced by crowns, and where one or two teeth were gone the adjoining ones were cut off to be used as abutments for a bridge. I have often removed crowns and found only a small approximal cavity on either side, and the tooth ground down just enough to admit the crown. Thousands of such teeth have been sacrificed that could have been filled and that would have done good service for many years. The reaction has already begun and the practice is now generally disparaged at society meetings. A revulsion has also taken place among our patients, so we may hope for better things. I do not mean to decry all crown and bridgework, for in many places it is invaluable, but in the closing words of the essayist, "Our rule should be to fill as long as possible and crown only as a last resort."

PHYSICAL DIAGNOSIS AS RELATED TO DENTAL COLLEGE CURRICULA.

ABSTRACT OF CHAIRMAN'S ADDRESS. BY A. H. PECK, M.D., D.D.S., CHICAGO. READ BEFORE SECTION ON STOMATOLOGY, AMERICAN MEDICAL ASSOCIATION, AT SARATOGA, JUNE 10-13, 1902.

During the past few years the courses of study have been lengthened in all professional schools. Only a short time has elapsed since a medical student could graduate after attending two courses of instruction of six months each, but now one is required to attend four courses of nine months each, after having gained a good scientific or classical education as a foundation upon which to build his professional knowledge, thus requiring from six to eight years of college work to receive his degree of doctor of medicine. Dentistry

has by no means been slumbering, for the educational requirements for admission to a dental college have been steadily advancing, and the number of years and length of terms increasing, until now schooling equal to the second year of high-school work is required, and in another year four years of seven months each will be required.

Only a few years ago a student received a few lectures on physiology, when that part of his course was considered finished, but now it is one of the most important branches he has. Histology, pathology and bacteriology have become important subjects, and the dentist would also be considered very lame without a knowledge of anesthesia and oral surgery. More than this, the amount of practical work that must be done as a part of the dentist's preliminary education has more than doubled. What is the object of this advance? It is that his knowledge may be broadened, extended and that he may be placed on a higher plane with mankind, as well as that he may be better able to satisfy himself and his patients after engaging in the practice of his chosen profession.

We, as professional men, are continually being called upon to give opinion as to the etiology and prognosis of certain diseases, and who will gainsay the statement that this we should be not only willing but able to do, and that it is imperative we be as nearly correct in such counsel as possible. At times we find this easy, and again it taxes us to the limit, if not beyond; all our knowledge and reason is called into play before we are able to make definite statements. It is not always an easy matter to tell just how much vitality a patient has, or how much of a nervous shock can be endured, or how long one can remain in a dental chair at a sitting without sustaining material injury. This we, as dentists, should know, so that our patients on leaving our offices will have received professional benefit instead of injury.

Who of you has not seen or is not cognizant of neurotic patients who were nervous wrecks for days after having had a large amount of dental work done? With the requisite knowledge and the exercise of forethought and judgment all this could have been avoided. A few more sittings of shorter duration would have completed the work, at the same time acting as a stimulus rather than a nervous shock. This knowledge we can gain only by a thorough study of our patients, and an understanding of the cause of their ailments. I hope to see the time when a dentist will inquire into the health

and symptoms of his patients before deciding on the amount of work that is proper and safe to be done at any one sitting, as a physician should before prescribing a certain amount of a drug or drugs.

To judiciously outline our work we, as dentists, must have as thorough a knowledge as possible of the various diseases of mankind, especially those affecting the vital organs or those organs most likely to suffer when shock is inflicted. The symptoms of these diseases, also the physiologic changes that may occur, are necessary to be understood. Who of us would keep patients afflicted with organic heart disease in the chair for a long and fatiguing operation if we were able to inform ourselves of their true condition.

There is only one way for us to gain this knowledge, and that is by familiarizing ourselves with the normal heart as to location, size, beat, rhythm and sounds, thus enabling us to recognize pathologic conditions when present. How embarrassing it must be for any dentist, after advising the administration of a general or local anesthetic, to be told, on consulting the family physician, that such a course would mean certain death to the patient, whether true or not.

Physical diagnosis is the term used to designate those methods which are employed in the detection of disease during life by the anatomic changes produced by it. The nature and extent of such changes can be recognized and appreciated only by the divergence which they cause in the affected organs from the known physical condition of these organs when in health. The significance of physical signs in disease cannot be determined by theory; but only by clinical observation confirmed by examination after death.

If it be granted that it is at all desirable that the dentist should possess this knowledge, it at once becomes evident that he must enter into a systematic and thorough study of the only methods by which these physical signs can be determined in the living subject, and these are: 1, inspection; 2, palpation; 3, mensuration; 4, percussion; 5, auscultation; 6, radioscopy.

Some of these methods have been in use for many centuries. Palpation, for instance, was used in the Neolithic or polished stone age, 1500 B. C., to demonstrate the presence of fluctuation, while radioscopy is practically new. This is the outcome of the discovery of the X-ray, by which with the use of the fluoroscope, tumors or solid bodies, that were impossible of discovery before, are located in various parts of the body. Fractures of bones, the exact kind and

position, are determined by looking at the bone direct. Tumors of the internal organs are observed by this means, thus enabling one to diagnose conditions which were impossible of discovery before the X-ray was in use.

One must also be conversant with the various areas into which the body is divided, and which are bounded by definite anatomic relations. This is necessary that one, being familiar with the normal size and location of an organ, can determine whether it is in its proper position. It is essential to know that the first area from a physiologic standpoint is the supraclavicular region; and that this area is definitely bounded below by the inner three-fifths of the clavicle, internally by the trachea, and superiorly by a line extending from the junction of the outer with the middle third of the clavicle to the top of the trachea. Also to know that normally within this area are to be found the apex of the lung, the carotid artery, the subclavian artery, the subclavian vein and the jugular vein. Next below this is the clavicular region, which is that part of the thoracic cavity lying back of the inner three-fifths of the clavicle. An understanding of the anatomic boundaries and contents of this region is also necessary.

The most important regions, from the standpoint of the dental practitioner, are the following: Infraclavicular, in which are to be found, on the right side, lung tissue, the ascending vena cava, the right bronchial tube lying back of the sterno-costal articulation, and a small portion of the arch of the aorta. On the left side are found the pulmonary artery from its origin to its bifurcation, the left bronchial tube lying a little below the second sterno-costal articulation. The next region of special importance to the dentist, and which lies immediately below the preceding one, is called the mammary. The lowest region in the anterior aspect of the thoracic cavity is called the inferior mammary.

Centrally located is the sternum, this area being divided into three regions: (1) The suprasternal; (2) the upper sternal, and (3) the lower sternal. The back is divided into three regions: (1) The suprascapular; (2) the infrascapular, and (3) the interscapular.

All these regions should be carefully studied, as indicated above, in the two instances in which the boundaries and contents are stated.

A knowledge of the size and exact location of the heart is especially important. In the average subject the base of this organ is

found at the second intercostal space, the apex beat or the maximum impulse being at the fifth intercostal space, from three-fourths to an inch to the left of the sternum. It must be understood that the apex beat does not locate the apex of the heart, the latter being about an inch to the left of the heart. The anatomy of the heart must be studied. It is necessary to know that there are four different valves, and what is expected of them in the performance of their normal function, and that the positions on the chest where the sounds made by the valves can be most distinctly heard are not immediately over the organ.

I thus briefly outline this foundation work that there may be no mistake as to what I consider necessary in the schooling of prospective dentists, that they may be able intelligently to apply the six methods of eliciting the physical signs of the various pathologic conditions of those diseased organs bearing directly on the practice of dentistry. It is also necessary to be thoroughly conversant with the meaning of these various methods of physical diagnosis, how each is to be employed, and what is to be learned by it; that inspection means only that which can be determined by looking at the patient without further means of diagnosis; that palpation means the examination of the parts by the laying on of the hands, and in this method only the tips of the fingers may be used, or the palms of the hands as a whole; that with mensuration certain facts are to be determined by the process of measuring; that by percussion is meant the tapping of the chest to elicit certain sounds under the varying conditions; that there are different methods of percussion, the immediate and the mediate; that auscultation is the act of listening for sounds within the body, chiefly to ascertain the condition of the lungs, heart, pleura and other organs; that there are different methods of auscultation, the immediate, which is the application of the ear directly to the part, and the mediate, which is by use of the stethoscope. The pulse is such an accurate index to many of the lesions of the heart that it is necessary one shall understand it in all its variations.

This is a subject that has engaged my attention for some time, and it was my desire more than two years ago to present this subject to the profession and urge its teaching in our schools, but listening to the advice of trusted friends that the time was not ripe for it, I desisted. During the past year it has been taught in the institution

with which I am connected. As I see it now, I cannot understand how anyone can advise otherwise. I hope to see dentists so instructed in the future that they shall be able to recognize diseased conditions of at least these vital organs, and thus be enabled to avoid serious and possibly fatal mistakes. When this knowledge is acquired and successfully practiced, the dentist at once gains the implicit confidence of his patients, his word with them becomes law, and his opinion is sought and respected. Such a dentist is a real benefactor in the community in which he resides and his success is assured. He also has the satisfaction of knowing that he is one who has participated in that higher education, the practice of which can result only in assisting to elevate the standard of his profession, and to place it on a higher plane in its relation to other progressive professions.

FORMALDEHYDE.

BY F. W. PROSEUS, D.D.S., ROCHESTER, N. Y. READ BEFORE THE
ROCHESTER DENTAL SOCIETY, MARCH 18, 1902.

Methyl aldehyde or formic aldehyde, the simplest possible aldehyde, is derived from the homologous series of hydrocarbons. The first of this series is methane or marsh gas, which has the for-

mula CH_4 (or graphically $\begin{array}{c} \text{H} \\ | \\ \text{H}-\text{C}-\text{H} \\ | \\ \text{H} \end{array}$), the one from which methyl al-

cohol CH_3O ($\begin{array}{c} \text{H} \\ | \\ \text{H}-\text{C}-\text{O}-\text{H} \\ | \\ \text{H} \end{array}$) is derived. This gives by further oxida-

tion formic aldehyde CH_2O ($\begin{array}{c} \text{H} \\ | \\ \text{H}-\text{C}- \\ | \\ \text{O} \end{array}$).

When we consider that the elementary structural formation of organic life and starting of all carbohydrates or food products come from this source, and that a substance which is akin to a poison and yet the only possible source of proteid anabolism is the basis of our very existence, the mind is indeed startled by the greatness of God's vast chemistry of nature.

The present generally accepted theory among botanists regarding

the conversion of carbon dioxid and water into carbohydrates, which takes place in green parts of plants under the action of sunlight, is known as the aldehyde theory, and was first proposed by B yer in 1870. It assumes that water unites with carbon dioxid in the chlorophyll grains to form formaldehyde, which is at once transformed into more complex substances and finally into starch, and from this starch the plant is nourished. The surplus not needed at once by the plant for growth is stored in tubers and grains, and is made of service to mankind for food.

Dr. Fisher of Berlin found that it is possible to build from formaldehyde the sugars, from one element to thirteen of carbon, and that those of the series of C_4 , C_6 , C_8 , C_{10} were fit for food.

Formaldehyde was discovered in 1869, and in 1888 Loew discovered its germicidal action. In Merck's market report for 1896 it is listed with the following statement—non-irritating, non-toxic, non-corrosive, surgical and general antiseptic, in wounds, abscesses, etc.; for clothing, bed linen, walls, etc.; food preservative, for wine, beer, jellies, preserves, etc.; preservative of collyria and anatomical or botanical specimens.

E. J. Bevan states that four drops of the commercial article to four ounces of milk is sufficient to keep samples perfectly (for chemical analyses) for six weeks or longer. It is being used by milk venders in Europe and the United States to give their milk keeping qualities, but with doubtful propriety. Weigel and Merkel found that it coagulates the casein and renders it insoluble in hydrochloric and acetic acid. On this ground its use in milk and food is inadvisable, as its general action on the human system has not been studied.

Formalin (sometimes incorrectly called formol) is the trade name of a 40 per cent solution of formaldehyde ($C H_2 O$) in water—a colorless, pungent gas, obtainable from wood alcohol, and readily soluble in water. It volatilizes slowly. Used in any sensible way it is perfectly harmless. The fumes when strong prove irritating to the throat and eyes, and if long continued might be harmful. A guinea pig kept under a jar for several hours with fumes from forty per cent formalin died some days after being taken out. It is not poisonous even when taken internally. Dr. Samuel Rideal says, "As to its toxic effect, I have not heard of any ill effects, and have myself repeatedly drunk the one per cent solution." Like every

other substance having active properties formalin is likely to prove injurious, however, if taken in excessive amounts.

A horse of about 750 lbs. weight was offered nearly a pint (300 c. c.) of dilute formalin containing four per cent of formaldehyde. He drank part of it voluntarily, and the remainder was given in the usual manner of a drench, but without resistance on the part of the animal. No inconvenience or bad effects were shown at the time or subsequently. Another horse was subjected to nine c. c. of full strength (forty per cent) formalin injected into the jugular vein. The reaction was immediate and violent. The head was first strongly shaken, with stamping of feet and other spasmodic motions. The muscles of the neck became rigid, and the head was drawn down as in tetanus. These effects lasted about twenty minutes, and in thirty-five minutes had entirely disappeared. The horse now ate and acted in a normal manner. After two and one-half hours the same operation was repeated with twelve c. c. of full strength formalin. The same effects were exhibited, but were much less violent. Six hours later the animal was killed, and showed only slight and unimportant irritation of the blood passages, such as the injection of a weak brine or other harmless solution would produce. The effects were not of a toxic nature. In still another test a strong, healthy horse of 950 lbs. weight was injected with twenty c. c. of undiluted formalin. So large an amount of irritating fluid could not fail to produce marked effects when thrown suddenly into the circulation. The symptoms which followed were somewhat different from those of the previous more moderate and gradual treatment. Marked uneasiness showed in three minutes, rising to distinct symptoms of colic, with spasmodic action of the alimentary tract. At the end of fourteen minutes the pulse was 76 per minute and weak, but no strong cerebral or tetanic symptoms had developed. At the end of an hour cyanosis was strongly marked, showing that the blood had been profusely affected. The horse was killed at the end of two and one-half hours, and the blood was found to be very dark and slow in coagulating.

These cases clearly demonstrate that it takes a large amount of formalin to produce marked or lasting effects, and that even under exceptionally violent treatment formalin has little or none of the action of a poison, but may have serious effects as an irritant, or possibly a disorganizer when in sufficiently large quantity.

F. W. Tunnicliffe and O. Rosenheim (London, 1901) drew from their results the conclusion that formaldehyde had no appreciable effect upon the proteid metabolism of a child, given the drug for a period of 27 days in its food. Doses of 1-5000 in milk, or 1-9000 in total food and drink, exerted no appreciable effect on the nitrogen or phosphorous metabolism or fat assimilation. In healthy children it produced retention of water in the body in above doses.

("Action of Formaldehyde on Enzymes." C. H. Bliss and F. G. Novy, Ann Arbor.) Formaldehyde in very small quantities will exert a peculiar action on proteid material, hardening it and otherwise altering its chemical and physical properties. Fibrin when allowed to stand in a solution of formaldehyde as dilute as 1-5000 soon hardens and resists the action of proteolytic enzymes, and although it may finally be digested, the process is nevertheless retarded. Again, egg albumen and blood serum to which a small amount of formaldehyde has been added will not coagulate when heat is added. In small amounts it inhibits bacterial growths and in larger quantities it promptly destroys them. Fibrin which has been kept in a solution of formaldehyde 1-100 for a day is scarcely affected by a solution of pepsin hydrochloric acid in a temperature of 38° C. for several hours. On the other hand, formaldehyde may be added to the digestive fluid in the proportion of 1-100, and at the end of several weeks this solution will be found to be still active and will dissolve fresh fibrin nearly if not quite as rapidly as a fresh solution of pepsin hydrochloric acid.

According to Loew, pepsin and diastase lose their activity when left in contact with formaldehyde for one day, solution being one gram of ferment to ten grains of water and five c. c. of fifteen per cent solution formaldehyde (= five per cent formaldehyde). Other ferments—emulsion, papain, trypsin, used in the form of crude products, gave precipitates with formaldehyde which were very difficult of solution in acids and alkalis.

Simons found that formaldehyde had no apparent effect on peptic digestion, but a very depressing action on the pancreatic ferment (trypsin), even one part in 2,000 being sufficient to retard digestion.

In Wurtz's "Dictionaire al Chemie" the statement is made that the soluble ferments, diastase, pepsin, pancreatin, etc., are all modified completely by formaldehyde. This statement Profs. Bliss and Novy claim does not hold true for pepsin, malt diastase, and rennin.

In their experiments saliva and malt were employed, and fresh pancreatic gland extract was used. Liquids for tests were 1-100 and 1-1000 of forty per cent solution formaldehyde Benedicenti (*Archiv. of Anat. U Physiol, Physiol Abhehlung.*)

Benedicenti claims that formaldehyde hardens proteids and renders them incapable of swelling in dilute hydrochloric acid and of being digested by pepsin hydrochloric acid or pancreatic juice.

From the experiments of Bliss and Novy it was found that pepsin and fibrin were soluble in formaldehyde of 1-100 after twenty-four hours and in solutions of 1-2500 in forty-eight hours. Their results, however, show that formaldehyde in very small amounts will alter fibrin in the course of a few days so that it will offer considerable resistance to the action of proteolytic ferments, peptic digestion being least affected.

Milk is not coagulated by formaldehyde, but it retards the coagulation of milk by rennet. (Pottevin.) Weigel and Merkel found that the digestion of milk and egg albumen is prevented by formaldehyde. It was proved that the action of digestion of casein with pepsin hydrochloric acid was retarded the same as fibrin if small amounts of formaldehyde had been added. From these experiments it was shown that a one per cent solution of formaldehyde acting on fibrin for twenty-four hours will render it practically insoluble in pepsin hydrochloric acid. Also, when added to milk it alters the casein to such an extent that it will not be precipitated, or but slowly on addition of rennet ferment.

Simons states that formaldehyde has no apparent affect on peptic digestion. In the action of formaldehyde on fibrin in the increase of formaldehyde there is a decrease of fibrin digested, due to the action of the formaldehyde on the fibrin and not to an alteration of the pepsin. When formaldehyde was added to saliva in small amounts it had very little effect on ptyalin in large amounts; at ordinary temperatures it had a depressing action but did not destroy the ferment for several days.

Glutol—(Dr. Schleich-Schering and Glatz Formalin Gelatin) is an odorless, non-irritating and non-poisonous antiseptic powder, forming a hard scab in a few hours when in contact with a clean wound. In infected and suppurating wounds it rapidly terminates pus formation. It is officially employed in the Berlin Fire Department as the best dry dressing.

Dr. Low of Buffalo has very ably demonstrated the practical sterilization of dental instruments with formaldehyde gas generated from wood alcohol or Columbian spirits.

From the data here gathered formaldehyde should be among the antiseptics in dental practice. In weak solutions it inhibits bacterial growths, in stronger it destroys them. Its action upon the digestive ferments has been demonstrated to be harmless in small amounts, especially when added to saliva, as the ptyalin was not affected, and as the dental treatment is limited to the oral cavity no ill effects could follow from the use of formaldehyde except irritation of the mucous lining and gingival borders of the gums from strong solutions.

Instruments placed in formaldehyde solutions darken and rust. Dr. Hurdy of Indianapolis, claims formaldehyde does not darken instruments unless organic matter, blood, etc., is on them. Dr. C. E. Marshall, Bacteriologist Michigan College, had instruments immersed for six months in a solution of formaldehyde two per cent of the forty per cent solution. I recently saw them and they were clean and bright, and no rust present. Borax had been added to the solution, which he claimed prevented rusting. He recommended this form of sterilizing instruments as very satisfactory and preferable to the gas-lamp method.

Mr. B., whom I recently met, was using a mouth wash of one dram of formaldehyde to twelve ounces of water for pyorrhea (about one per cent solution.) He claimed it was irritating and reduced it one-half. The tongue was stained a deep bluish black. He believed this staining was produced by the formaldehyde, but as there were indications of mercurial treatment it could not be considered important. He also applies one-half per cent solution for falling hair, and cited a case with good results used for grayness.

Kellog's fiddle-string paste, which turned up almost simultaneously with the introduction of pressure anesthesia, probably contained cocain and formaldehyde. A kind of I touch the button (cocain) and you do the rest (formaldehyde.) In most cases the cocain made connections, but after the formaldehyde failed to string its fiddle, and when toothache later necessitated opening the pulp-chamber, the raw material (putrefaction) was found instead of the finished chord.

The European dentists are going one step further by removing

the pulp body and filling the chamber with some paste containing formaldehyde. This practice is really worthy of careful investigation, and should results prove the uselessness of removing the portion of pulp in the canals, the care and treatment of pulpless teeth will be brought from a difficult to an easy operation. However, thorough instrumentation in removing the contents of the canals is probably the safest practice, but undoubtedly many times portions are left, even by painstaking operators, and in such cases a root filling containing formaldehyde is ideal.

Capping exposed pulps with cements or pastes containing formaldehyde I believe to be doubtful of recommendation. Gradual pulp devitalization takes place, and as the amount of formaldehyde is not sufficient to thoroughly harden the mass, decomposition eventually follows. Capping nearly exposed pulps with formaldehyde cements is probably good practice, as the absorption of the formaldehyde by the pulp does not take place, and the bacteria in the tubuli of the area of dentin over the pulp are inhibited from further activity.

Some of the formaldehyde preparations on the market are highly irritating when placed over the pulp. Formagen cement filled a long felt want, but was difficult of manipulation. Schuer's formaldehyde paste has given me great satisfaction, and also the iodoform root filling. It is easy of manipulation, soluble in the essential oils, creosote, and carbolic acid, it can be pumped into the finest canals, and as a temporary dressing under gutta-percha it sterilizes cavities and keeps comfortable teeth with large areas of decay until a future visit. In setting crowns and bridges temporarily it prevents accumulation of saliva between the tooth and crown and arrests decomposition, and has no odor even after several weeks.

Formaldehyde as a prophylactic in dental operations very strongly appeals to me. Dr. R. H. Hofheinz before this society three years ago gave his method of applying the rubber dam and forty per cent solution of formaldehyde. Since then I have treated teeth in this manner without the formaldehyde irritating the soft tissues, as the doctor had experienced. The beneficial results from this method I can only guess, but believe the future may tell us of the true merits of what appeals as a scientific and rational treatment.

Discussion. *Dr. R. H. Hofheinz*, Rochester: The dentist's interest in the drug begins with its local application, and as an anti-

septic and germicide it deserves our practical attention. It seems to me that its irritating effect upon the soft tissues, if used in the forty per cent saturated solution, is underestimated, as it is extremely irritating. I called attention to this fact when formaldehyde was introduced. It has the most valuable property a germicide can possess, as it diffuses with great rapidity and combines with all sulphureted and nitrogenous material and decomposition, and forms new chemical compounds which are in themselves antiseptic. These qualities give the drug a unique position in dental therapeutics. As a pulp-capping, in the shape of formagen cement, I place it very high, providing the pulp is in a slightly pathologic condition. A pulp physiologically normal on its exposure is safer capped with a neutral and non-irritating substance, as oxysulphate of zinc. When, however, a doubt exists, and capping is nevertheless demanded, a preparation containing formalin, owing to its preservative quality, is decidedly to be preferred. The same is true where dead pulp tissue has been left in the canals. We are, however, looking altogether too much for drugs to take the place of conscientious, painstaking operative methods. Partial removal of pulp tissue, with the assumption that formaldehyde or any other drug will render the remainder inert and harmless, is as yet an unscientific and slovenly method of procedure. There are a few cases where it is justifiable, but to apply it to all dead pulps is malpractice. The question arises, if a root canal is mechanically well cleaned and thoroughly sterilized before filling, of what need is an antiseptic? If there is an after-infection through the tubuli, irritating the peridental membrane, it may be indicated, but if the infection comes from the periapical space, where microbic life may have been dormant until something caused disturbance, an antiseptic filling is less efficient.

Dr. J. H. Beebee, Rochester: I have used formaldehyde for some time in my practice, employing the following formula: Cocain, hyd., Thymolin aa grains 15, mix thoroughly and add formaldehyde, drops 10; oxid of zinc, grains 30, and make a paste. As formaldehyde is very volatile, I keep this preparation in a ground-glass covered bottle, oiling the joint. This oil is essential both to exclude air and to keep the paste from cementing the cover to bottle. This preparation will keep about a month before hardening, and it must then be renewed. As it is almost insoluble, I use two

bottles, cleaning one with sulphuric acid while the other is employed. I use the paste on cotton as a dressing in the treatment of putrescent canals, also for filling canals. In the latter case I wind silk fiber on a broach, and having dipped it into the paste I carry it to apex of root, continuing the procedure until the canal is filled. This plan has the advantage that in case of subsequent inflammation the strong silk fiber allows the whole filling to be removed. This paste hardens until it becomes about like half-dried putty, and it is non-absorbent. It is well known that formaldehyde hardens tissues without shrinking them, and even if all the pulp should not be removed, there is no need for anxiety. I recently devitalized the pulp in an upper third molar, and having difficulty in getting at the canals, I packed the chamber with this paste. On removing extraneous matter at a subsequent sitting, I found the pulp hardened so that it looked like slivers of red wood.

THE TRUE DEPARTURE—EXTENSION.

By A. G. BENNETT, D.D.S., MINNEAPOLIS, MINN.

The "New Departure" has departed—

The atmosphere is calmer;

The Chase was up, the Flagg was flying,

But the palm has gone to Palmer.

Still in the procession with some digression,

But never in a "hollow,"

He did not deem it wise—"the extreme

That few will choose to follow."

All three did agree on the theory,

Which was the electro-chemical.

It was discussed 'mid smoke and dust

Decidedly polemical.

There was a gleam like morning beam—

The scheme was set agoing

But ere one had said, "Look out ahead!"

The train was surely slowing.

Though in these currents did occur

Some incident destruction,

The currents of thought were quickly caught

By circles of induction.

They flashed a light that aided sight,

Revealing still some lesion.

One thing was clear—we must have here

Extension of the vision.

When all concede that some must lead,

There is no need of blinking

The fact that few must always do

The microscopic thinking.

II

Like dots and dashes and far-off flashes,

Came hints of an invasion

Of hosts that blight though out of sight,

The cause and the occasion

Of all diseases that ride on breezes,

Or lurk within the water;

The mail of health they pierce by stealth,

And all the vitals slaughter.

That "Giant Killer," our own Miller,

Pursuing the germ to his lair,

Has driven the picket from the thicket,

And laid his hiding-place bare.

And then the "Lactics," which our old tactics

Did so disastrously ignore,

Were so dammed in with germs jammed in,

Only ruin wrought the more.

Signs of acidity we scan with avidity,

And follow to their sources.

Our lines we lengthen and doubly strengthen,

To defend the vital forces.

O ye untactical, so-called practical,

That nothing see beyond the sight,

Proof of existence is in persistence—

The undefeated still will fight!

Who faces danger must be no stranger

To tactics of the foeman;

It is not shouting that leads to routing—

But only exposes the "showman."

Like those under the banner of the strenuous "tanner,"

We soon learn to love a "hammer,"

Who has the design to fight it out on this line,

"If it takes the entire summer."

III

What's remaining but true training,
Since the fight depends on you.
'Tis self-reliance with true science,
That will bear each safely through.
Old campaigners are the trainers—
These the trusty, though the few;
They bear the banners, these great planners—
Our own leaders, tried and true.

There's one suggestion of a question,
And no mystery or myth,
For 'tis decided fame's divided
Fair between our Black and Smith.
If they be not equal, wait the sequel,
As the years go wheeling by;
'Tis safe investing in time's true testing,
And the Future's sure reply.

'Tis no invidious or "deciduous"
Effervescent scheme they own,
But extension for prevention
Just beyond the danger zone.
And the extension of prevention
Where "microbic plaques" are grown;
And then extension of apprehension
Of the reaping what is sown.

But great extension, frail retention—
Squarely based or on a curve,
Did you but know it, time will show it;
You are building on your nerve!
Go carry extension to the fourth dimension—
Most truly the "crowning" endeavor.
'Tis this suggestion that "corners" the question
And settles it once and forever.

All cloudy conditions, strategic positions,
And all that forms the environs—
These may be sure much more impure
Than the vilest verses of Byron's.

Of all the states that Nature hates—
Which mean eradication—
That fill alone a shadowy throne—
That status is stagnation.

IV

The very mention of extension
Brings out the blank areas,
Where there is need of a better breed,
And extension of ideas.
Extension then of comprehension,
Till Nature's order reigns,
Where mental chaos would betray us
In anarchistic brains.
The merest mention of prevention
Brings out the true ideal,
And each resource and all our force
Combine to make it real.
Like the strenuous life with vigor rife,
With virile force abounding.
It has no need of any creed—
It does its own expounding.
A strong alliance then form with science,
That never swerves a fraction;
Triumphal arches mark her marches,
But never a reaction.
With steady stages down the ages,
And up against this hour,
She moves along with current strong,
And with resistless power.
Not revolution, but evolution!
Stage by stage along the grooves,
In the grand endeavor in which forever
The whole creation moves.

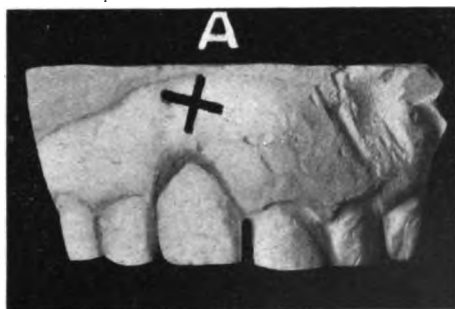
IMPLANTATION—ONE OF THE PERMANENT OPERATIONS IN DENTISTRY.

BY ROBT E. PAYNE, D.D.S., M.D., NEW YORK. READ BEFORE THE ALUMNI ASSOCIATION OF THE NEW YORK COLLEGE OF DENTISTRY, MAY 21, 1903.

Let me quote from Dr. J. S. Marshall's Operative Dentistry, 1901:
"Implantation is an operation not to be recommended, except under

the most favorable circumstances, namely, when a freshly extracted tooth can be inserted into the newly-formed alveolus of a youth or young adult of the most perfect health and constitution." I do not limit implantation to such a narrow field, as it has a place in everyday practice; it ranks among the permanent operations of dentistry; it can be performed without pain. Age is no barrier, providing other conditions are favorable.

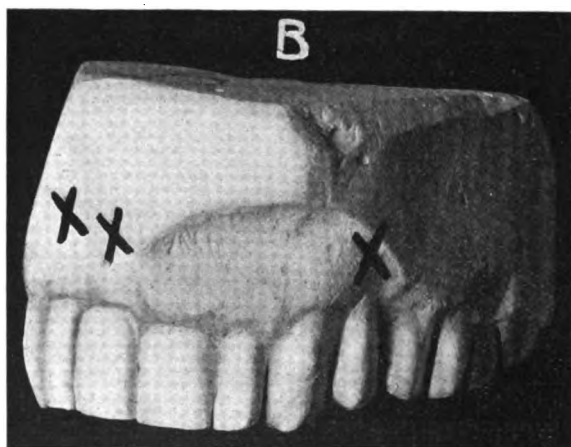
In the year 1882 Calvin Brooks lost a right superior central incisor by extraction. The gum and process healed promptly and the missing tooth was replaced soon after by an artificial substitute on a vulcanite plate. On October 5, 1885, Dr. Wm. J. Younger implanted a natural tooth for this patient, then aged 45, to replace the missing incisor. The clinic was given in the presence of Drs. Wm.



Atkinson, W. W. Walker, E. P. Brown, E. S. Gaylord, M. L. Rhein, C. M. Richmond, C. F. W. Boedecker, Jas. McManus, R. Ottolengui, P. L. Hull, S. C. G. Watkins, B. F. Luckey, N. W. Kingsley, and others to the number of probably one hundred: Dr. Younger proceeded as follows: No cocaine or other anesthetic was used. The gum was opened by a double flap from the crest of the process each way. A cone socket was then trephined in the bony process to receive the central incisor root full size, care being taken to keep the pericemental membrane intact. The tooth used had been out of the mouth about four months. After removing the dried contents of the pulp chamber, the tooth and open canal were sterilized with bichlorid 1-5000, then dried and filled, and the apex sealed with gold. It was placed in the new socket cut to receive it, and ligated in position with silk twist. The entire operation consumed forty-five minutes. Eight days after the clinic the ligatures were removed and the implanted tooth received no further care.

This incisor was serviceable in every sense for a period of nine years and a month, and was of as good color as any tooth in the mouth. It probably would have remained in many years longer, but Dr. Charles Atkinson, after advising with Dr. Younger, extracted it to see what the root of an implanted tooth after nine years would develop. A considerable degree of force was required to remove the tooth from the socket, and it was in good condition, except a very slight resorption where the apical foramen had been sealed.

The left central incisor in the mouth of this patient had been

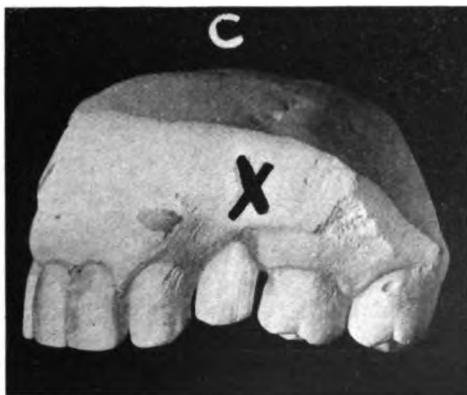


filled with gold by Dr. Secord at a clinic, and as this tooth was dead and the time limited, it could not be thoroughly treated when the filling was inserted. The tooth gave some trouble, part of which was attributed to the implanted incisor, and was the only excuse for extracting the implanted tooth, other than to make examination of a nine years' success. The left central after treatment resumed normal conditions.

Mr. Brooks, at that time 54 years of age, was again minus a central incisor and compelled to once more take refuge in an artificial substitute. In 1887, three years after Dr. Atkinson had extracted this tooth, I learned of the case, sent for Mr. Brooks and on May 7 I implanted another central incisor, occupying the same position as the one inserted by Dr. Younger. This operation was

accomplished at eight o'clock in the evening, by gas-light, and was painless under the effect of two per cent cocain. That was five years ago this month. The tooth is as firm, healthy and serviceable as any tooth in the mouth, and the patient is 62.

I submit a model of this case, cast marked A. Also models of two other cases in which I implanted three anterior teeth in one mouth and replanted three in the other, both women, one forty-two, the other younger. The case of replanting, model B, patient forty-two, was performed on account of looseness following Riggs' disease. This case was treated in June, 1897, three teeth being removed, the sockets deepened, and the teeth replaced in position in the arch. The other case, model C, implanting, was treated in



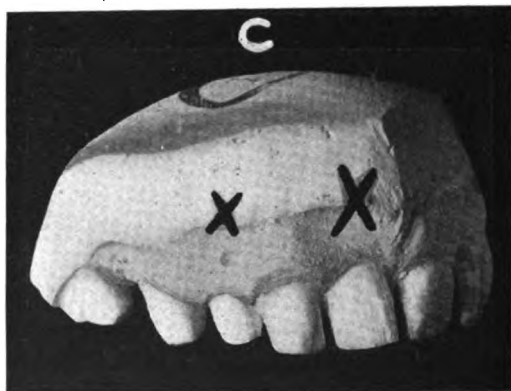
January, 1897. Three front teeth were implanted. All are firm, healthy and serviceable. All teeth replaced are marked X on models.

During five years I have a record of thirty, and can trace but one failure—due to a fall which injured the process severely. I have a record of one other case of three upper anterior teeth, right central incisor, left cuspid and left bicuspid. This case was one of the most difficult I have ever undertaken, for the reason that it was complicated with pyorrhea in an aggravated form. It was reported in *Items of Interest* in 1897, and the teeth are healthy and serviceable at this date.

In this case the process was very scant where the right superior central was to be implanted. I found it necessary to use a very

small root, to which I adjusted a Logan central incisor. I cut two flaps, the anterior long and the posterior short. The long flap was brought forward to fill up the deficiency due to shrinkage of the process. To shorten the cuspid for implanting in this case, I cut out a section and re-united the crown and root by means of a gold pin, rather than cut off the end of the root.

This record of ten implantations, with other successes wherein conditions have been very unfavorable, encourages me in the belief that age and condition are not a barrier; that any mouth that will retain other natural teeth will retain any of the ten upper anterior ones implanted in single spaces. Natural sound teeth implanted



for a patient under 60 years of age will remain firm and serviceable for five years, with chances greatly in favor of lasting ten. I think this is proven by the results in these cases. I consider this evidence a claim for implantation as one of the permanent operations in dentistry. You do not expect more from other operations; why should you from implantation? Do not deprive your patients of the benefit that an implanted front tooth can give, simply because it does not last a lifetime. It has a place. Its usefulness is greatly in favor of single spaces where one tooth is missing.

A small root must be used. Shorten the tooth and make the cone shorter by cutting out a section of the root from the enamel border, about one-third of the way to the apex, then splice the two parts with a gold pin, cement in the root canal and pulp-chamber. In trephining a socket, incline the apex of same lingually or you may

cut through the anterior plate of the superior maxilla and the operation will be a failure. The root must be surrounded by the bony process. Always cut a double flap. Do not remove any gum—you will need it all for restoring the gum festoon. Keep the margin of these flaps packed with an antiseptic, boric acid, iodoform, or resorcin, to prevent infection during the process of repair. Avoid direct occlusion. Keep the pericemental membrane intact.

Failures are probably due to cutting through the anterior plate, cutting too deep, infection, denuding membrane, imperfect splinting, as gold bands lodging food particles that remain and develop bacteria. I believe successes are due to the selection of mature teeth, to an intact membrane, small roots, never cutting off apex, pitching the tooth lingually, preventing infection in the manner described, ligating with silk twist and avoiding direct occlusion.

If a tooth be selected, extract same from an adult in good health and more than forty years of age. Such a tooth, mature, firm and hard, is resistant and lasting and will not break down and resorb. There is no advantage in a large root. The membrane intact aids in the process of bone repair about the root of the tooth; it becomes swollen, acting not unlike a sponge graft, and in a degree closes the space between the pericemental and alveolar walls, also affords a scaffolding for the formation of loops of blood-vessels, and in this way furthers the process of bone repair about the root.

I implanted two gold capsules in an upper jaw in June, 1900, and a silver capsule at the Paris clinic. Since my return I have implanted a tin capsule, gold plated. The capsules were spread by means of rubber to accurately fit the socket, and in this a porcelain-rooted continuous gum tooth was cemented. The capsules gave no pain; the teeth were firm for a time but were all failures, remaining in the jaw but two months. The operations were faulty, due to imperfect capsules.

While in Berlin I met Dr. Hahl, a dentist of note, who for the past fifteen years has assisted Dr. Von Bergman, the world-famous surgeon of that city, in the adjustment of metal splints. He exhibited eight or nine models, or duplicates of metal splints, illustrating the method of uniting the fragments of the lower jaw, following resection for carcinoma. Aluminum splints were used, and held in place by silver screws. This united the ends of the jaws in position and sustained an artificial denture, making the patients comfortable while they lived, in some instances extending into years.

Dr. Michel of Paris, who is famous for imbedded splints and for researches in the chemistry of the fluids of the body, with whom I had several talks, gave as a possible reason for the intolerance of the capsules and tolerance of the splints the following: "The screws are held or tolerated in the denser portions of bone that have the aid of the recuperative power of the periosteum, while the diploe or medullary portion, as that between the plates of the superior maxilla, having less reparative power, breaks down and the capsules are lost."

Referring to the casts passed among you for inspection, you will note that the Brooks case is not ideal by any means, but the tooth is firm and serviceable, looks well in the mouth, and I merely show this cast of an imperfect case to prove the toleration of the hard tissues of the jaw in the implantation of natural teeth, and to show how they will cling and be retained as useful, comfortable teeth, even under the most adverse conditions, and at an age past adult life, namely, sixty-two. This socket drilled into the process of the upper maxilla has held a natural planted tooth over a period of fourteen years, and it is a serviceable organ to-day, with every appearance of remaining many years to come.

CLOSE SHAVING.—A writer in the *Medical Classics* looked through a microscope at a closely shaved face, and he reports that the skin resembled a piece of raw beef. "To make the skin perfectly smooth requires," he says, "not only the removal of the hair, but also a portion of the cuticle, and a close shave means the removal of a layer of skin all around. The blood-vessels thus exposed are not visible to the eye, but under the microscope each little quivering mouth holding a minute blood drop protests against such treatment. The nerve tips are also uncovered, and the pores are left unprotected, which makes the skin tender and unhealthy. This sudden exposure of inner layer of the skin renders a person liable to have colds, hoarseness and sore throat."

EPILEPSY AND BIBLICAL VISIONS.—In "Theories, Apparitions and Visions, relating to Biblical History and the Koran," Sir Thomas Lauder Bruton, the great medical authority, declares that in his opinion the seers of Biblical history were afflicted with nervous diseases, notably epilepsy. He states that sodium salicylate used for rheumatism often produces the same effect. He declares that certain forms of headache produce peculiar zigzag apparitions, which, in conjunction with excessive imaginations, were doubtless accountable for the fairies seen. This zigzag appearance is to be found in Dore's drawings and in the spirits of Dante. In Sir Thomas' opinion, "if Mohammed had been dosed with bromid of potassium when he had his visions, there would have been no Koran and no Mohammedanism."

Digests.

METHOD IN WHICH NITRATE OF SILVER AFFECTS CARIOUS DENTIN. By Dr. Josef Szabó, Budapest. *Osterreichisch-ungarische Vierteljahrsschrift für Zahnheilkunde*, January, 1902. Reviewed for the May *International* by Dr. W. H. Potter. The author gives a very carefully prepared history of the uses of nitrate of silver in dental practice, beginning with the year 1846, and quotes leading exponents of the drug. He then comes to the question, What is its penetration power, and what is its chemical action on the fibrillæ? As to this power, there has been considerable divergence of opinion, some holding that it could not penetrate into the tubules, and others that this power was so great that the pulp might be endangered. Investigations as to the penetrating power of nitrate of silver have heretofore been made upon extracted teeth. The author, however, considers that they may react differently with the drug than teeth which are in the mouth. He therefore makes his experiments upon living teeth. A right and a left lower first molar each having a crown cavity are selected. The rubber dam is adjusted, and the cavities are dried out and excavated as far as possible. The nitrate of silver is then applied in different forms, viz., in powder, as a ten, twenty, thirty and forty per cent solution. The applications are made five, fifteen, eighteen, and twenty-five times. After the experiment the tooth is extracted and examined under the microscope. Pictures are given of some of these examinations, and show clearly the penetration of the drug when in contact with living dentin. "Without regard to the concentration or method of use, we find the same result. The carious dentinal tubes are filled up to a certain depth with a coarsely lumped contents." According to these observations the tubules are affected only to a certain depth; when this is reached further applications of the drug cannot force it deeper. The infiltrated dentin layer was about one-half millimetre thick. A deeper penetration could never be observed, even though the most diverse solutions were used.

In regard to the question as to how nitrate of silver acts upon the contents of the dentinal tubules, this explanation is given: "The living albumin is changed, under the action of the silver salt, to

dead albumin. The plasma is changed from a soluble condition to a solid mass. The albumin unites itself in the form of a precipitate with the metal of the silver salt. The finely granular albuminate of silver is easily recognizable under the microscope, and shows its characteristic properties. Under the action of light it becomes dark, then black and insoluble." The author, in concluding, says that he must agree with Walkhoff that nitrate of silver has a relatively slight power of penetration and does not act deeply enough to endanger the vitality of the fibrillæ.

* * *

COTTON-WOOL ADMINISTRATION IN A CASE OF A SWALLOWED PLATE. Dr. J. Jameson Johnston, of the Royal City of Dublin Hospital, describes in the *Medical Press* an interesting case in which cotton-wool was given internally and with complete success to accomplish the removal of a denture from the small intestine. The patient, a man aged 20, swallowed his plate while bathing. He was conscious of the plate being stuck in the back of his throat, but had no difficulty in breathing. On being struck sharply on the back a dyspneic attack ensued, due to the plate changing its position; further slapping relieved the breathing, but he suffered great pain. Dr. Flood saw him and advised his removal to hospital. During the journey the jolting of the car appears to have caused the plate to go further down the esophagus, and Dr. Johnson found him, soon after his admission to hospital, in a very exhausted condition, pale, and in a cold perspiration. Breathing was not difficult, but he complained of severe pain, which he referred to the lower end of the sternum. Digital exploration and palpation of the neck failed to reveal anything abnormal. Swallowing a teaspoonful of milk caused great pain. A sponge probang was passed without any appreciable resistance into his stomach. The passage of the instrument was evidently painful, and the probang returned smeared with bright blood. The relief was so marked and maintained as to suggest that the plate had been passed into the stomach. The patient was quite positive that the plate had been swallowed and had not been ejected. Doses of 5 m of liq. morph. mur. were given every three hours, with the twofold purpose of allaying the pain and minimizing peristalsis. Much pain was experienced on Friday night, all day Saturday and throughout Saturday night, ceasing early on Sunday morning. The

pains were paroxysmal in character, and occasionally were violent. On Saturday there was a distinctly tender spot approximately over the pylorus. Dr. Johnston was unable to discover any signs of gastric peristalsis, owing to the rigidity of the abdominal wall during the attacks. A wax model of the plate was supplied on Monday, its shape and the nature of its clasp suggesting the question of gastrotomy. However, it was decided to wait and administer cotton-wool. This was given in thinly teased-out layers in bread and butter sandwiches. The patient was carefully examined by means of the Röntgen rays, by Dr. E. J. Watson, but no indications of the plate were seen, although the screen showed most distinctly metallic buckles and buttons through the whole thickness of the body. The only explanation would seem to be that the plate was in the small intestine and the peristalsis prevented the plate remaining sufficiently long in one position to be recognised. The following Friday, *i.e.*, a week after his admission, paroxysmal pains again ensued, referred this time to the right iliac fossa. Palpation over the ileo-cæcal valve caused the patient to wince from pain. The pains were of shorter duration than previously and not so severe.

About 3ss. of liquorice powder was administered, and next morning (Saturday) a motion was passed, revealing nothing. Three hours later his bowels were again moved quite painlessly, and the plate was seen enveloped in an admixture of cotton wool and fæces; the cotton wool was firmly entangled around the large clasp on the right side of the plate, but was easily removed from the other parts. The patient left the hospital next day, and has been perfectly well ever since.

The plate is described as weighing 95 grains and measuring 4 centimeters long by $1\frac{1}{2}$ wide, carrying a right upper lateral and cuspid, with a long clasp for the right first bicuspid and a short one for the left first bicuspid. The plate was presumably made of gold or dental alloy, though Dr. Johnston does not mention this; but in the heading it is described as a metallic denture.

The history of the case seems to show that the plate at first stuck in the back of the pharynx, and changed its position owing to the slaps on the back, pressing on the glottis and causing great difficulty of breathing, with cyanosis and prominent eyeballs. The dyspnea was relieved by further slapping, the plate slipping down

into the esophagus and remaining there until pushed by the probang into the stomach, where it remained until the Sunday morning. The passage through the small intestine lasted until the following Friday. The paroxysmal pain in the ileo-cæcal region points to its passage through the ileo-cæcal valve, and the laxative which was given hastened the passage through the large intestine, which was terminated next morning.

Dr. Johnson concluded his description of this instructive case by remarking that the treatment adopted was not original, but was not as widely known and appreciated as its merits entitle it to be.

* * *

SURFACE MARKINGS UPON THE TEETH. By J. J. Madden, D.D.S., Buffalo. Read before the Annual Convention at Rochester. Nature's method of construction of the teeth may be read in the plainest language by studying the markings upon them. Each line of calcification may be said to represent a chapter in her book. When her building process is suspended through disease the point is marked in such a manner that we are able to tell, by the markings upon the enamel, at just what time the trouble occurred. When the work has gone on without interruption the markings present themselves in the form of grooves, ridges, sulci, and fossæ. Each of them give us an invaluable guide in the carrying out of operations upon the teeth, and if their true significance is not considered our success is placed in jeopardy.

The grooves are of two varieties, viz., *developmental* and *supplemental*. The first mark the coalescence of the lobes or plates of enamel, while the latter are the finer ones found upon the surface of the molars in particular. The knowledge of the exact location of the developmental grooves is very important, for the reason that the tooth is less resistant to the onslaught of decay in these grooves, and because the enamel is not as heavy at these points; and again, they are found to be deep, sometimes taking on the form of fissures.

The ridges are usually found forming the boundaries of the crowns of the teeth, and are divided into marginal, triangular, oblique, and transverse. The enamel is heavy, and in turn they encroach upon the body of the dentin of the tooth.

The sulci and fossæ are found upon the occlusal surface of the bicuspid and molars. The locations of these normal surface markings should not be lost sight of, nor the very important part they

play in the scientific preparation of the cavity for filling. I feel safe in saying, that if we would pay more attention to the construction of the incisors, the chisel would be brought into use in many more cases, and many successes would supplant our failures. Have we not seen case after case where the lingual surface has been used to form the floor of the cavity, and a short time afterward we could see signs of infiltration, and a breaking down of the marginal ridge? This knowledge of the topographical markings is just as essential to us as the marks upon the body are to the surgeon.

The grooves are, metaphorically speaking, the highway to our offices. From the time of the eruption of the first molars until the third molars are in place it is a battle to keep the surfaces intact. A point not to be lost sight of is the deep penetration of decay that we often find upon opening into the grooves and sulci, forming, as they do, inviting places for the growth and development of bacteria. The ridges upon the teeth play a very important part in the outlining of the cavity, on account of their seeming solidity and firmness, but it behooves us to decide in a very careful manner before we use them as a supporting base for filling material. I have in mind the marginal ridges of the bicuspid and molars in connection with the filling and finishing of mesial and distal cavities. Nowhere is the knight of the chisel more needed than in the preparation of these cavities where decay has weakened the grinding surface. Picture with me, if you will, the well-defined marginal ridges on the bicuspid and molars, inclosing a concave surface broken by grooves and ridges, and these taking the force of occlusion and mastication. It has seemed to me that it would be a very small cavity with easy means of access that should be confined to the one surface, mesial or distal. I have observed that when decay has attacked the mesial or distal surface of a bicuspid disintegration is likely to form a union with the mesial or distal pits, as the case may be. Many cases might be cited, tending to show how important a rôle the ridges play under the stress of mastication, and again, when they have become undermined through decay they contain the poorest material for supporting a filling.

Another group or set of markings that we meet are those formed during calcification. How beautifully and indelibly written is the story of the calcification of the teeth! From the fifteenth or seventeenth week of embryonic life until the twentieth or twenty-first

year later nature is busy building the sentinels of the tongue. How jealous she is of her work and time is seen when disease endangers the health of the child. She stops her work for a time, and when she returns we know of her absence by the transverse lines and depressions seen upon the teeth, and all the calcium-containing foods known to science could not repair the loss. We ought to have clearly defined in our minds, in the majority of cases, the different periods of calcification of the permanent teeth, beginning with the first molar at twenty-five or thirty weeks of embryonic life to the completion of the crowns of the third molars between eleven and twelve years.

Eruptive diseases during the early life of the individual, say between one and one-half and five years, often leave their marks upon the anterior and bicuspid teeth, and constitute dyscrasiæ. Again, tendencies are inherited. A number of years ago a prominent English writer laid great stress upon the effects of inherited syphilis upon the teeth, pointing out the peculiar concentric shape of the edges of incisors, together with the peculiar ashen hue of the enamel and the general shape and outline of the tooth. We should be very careful, however, on meeting with teeth approaching this description, as markings of this character might be confused with the three tubercles forming the first points of calcification. If such a diseased condition has been inherited, other tissues will show better evidence of the fact than the teeth, while the latter will help to confirm the diagnosis.

A most peculiar and compensative condition is sometimes seen upon the occlusal surface of the first molars when the whole surface presents an unformed condition; the dentin is of a hard and firm nature, and very resistant to decay. I recall two or three young patients with the first molars in such condition, and it is surprising to see how the dentin serves the office of the enamel. With the anterior teeth, pigment matter is readily deposited in the depression, and often presents an unsightly appearance. I have seen cases in which the places have been filled and operated upon, when the patient was from nine to fourteen or fifteen years old. I believe we should not be hasty in operating; rather cleanse the surface, using bleaching preparations to remove the pigment material, and polishing the surface occasionally with a fine stone. By removing the superficial surface of the enamel we may produce an effect tending to give a smooth appearance to the surface. I have one patient that

had a very marked condition of this character, due to imperfect calcification, and in the last four and one-half or five years the improvement, due to the occasional touching and polishing of the surface, is such that all concerned are much pleased and gratified.

Markings due to pigment matter laid down in the tissue constitute an abnormal and rare condition in the teeth of man, while in some of the lower animals it is characteristic. In man it is not a very easy matter to decide whether the pigment matter has actually infiltrated the surface or the material was laid down, but I have observed that in the latter case the places affected are favorable points for decay to attack the tooth. We have all seen the peculiar brown and white spots upon the teeth, and noticed how they dissolve under the pressure of an instrument. They cause operators considerable trouble to obliterate them.

The last variety of markings are those caused by external agencies. How many patients have told us the same old story of taking tincture of iron, and all sorts of drugs have been charged with staining and marking the enamel. We must acknowledge that some physicians still retain their liking for the old-fashioned tincture of iron, and they have good reason, but they should instruct the patient as to the deleterious action of the acid solution upon tooth-structure. I have seen peculiar cases where patients have stated that their teeth were in almost perfect condition before they used iron and Peruvian bark. The condition I saw was something new; the markings while separate covered the anterior and bicuspid teeth, some being round and others concentric and of divers forms. I am at a loss to account for the peculiar disposition of the markings, and trust some of those present may further enlighten me.

The most common markings that we find, due of course to a diseased condition, are those showing the presence of defects in the form of opaque spots near the cervical line and on the different surfaces. They indicate that chemical change is going on, and the enamel is breaking down, allowing the entrance of microorganisms into the dentin.

For some time I have made use of the 3 per cent and 25 per cent solutions of pyrozone as a means of finding the extent of the chemical action upon the enamel near the cervical border, and with satisfaction in that some of the markings due to decay became far better defined under the action of the oxygen.—*Cosmos, April, 1902.*

BLEACHING OF ENAMEL AND DENTIN. By Joseph Head, D.D.S., Philadelphia. Read before the Central Dental Society of Northern New Jersey, November, 1901. The necessity for bleaching tooth substance is always to be considered from two aspects: the esthetic and the hygienic. When in times past the discoloration occasioned by a shining gold filling was considered a mark of beauty and of aristocracy, lesser stains on the enamel were unnoticed, but with the advent of porcelain fillings the necessity for removing discolorations in dentin and enamel become a crying necessity. Yet great as this esthetic necessity is, the greatest necessity of all is cleanliness and hygiene, for when the enamel is infiltrated with germs of decay, even though it appears hard and smooth to the instrument, the life of that enamel is on the ebb. Microscopic slides of Miller and Choquet show this only too plainly, and fillings placed in such enamel margins are from the start doomed to failure.

When a pulp is removed from a tooth and the cavity is filled without proper antiseptic treatment of the dentin, and that dentin becomes discolored, it is a subject for serious consideration, if such decomposition may not have a harmful effect upon the cementum. Even latent decay is a serious menace, and we should never lose sight of the fact that any bacterial stain in enamel or dentin may need only a chance stimulus under favorable conditions to become the forerunner of a cavity. These stains may be removed by bleaching and polishing, yet as bleaching is sterilization to extermination, it is more effective than polishing, which in most instances removes only the outer part of the bacterial colony.

The difficulty of bleaching a tooth internally by medicaments applied to the dentin is inversely proportional to the necessity, for that half of the crown adjacent to the cutting edge of a discolored tooth is the portion esthetically most important to bleach, and as before noted, it is just that portion which the bleaching fluid cannot easily reach through the dentin. How often in times past have we been able to bleach the cervical half of a crown, while the other half defied our utmost endeavors, because the dentin tapered to the thinness of paper long before the cutting edge was reached. Therefore it is evident that numerous failures will continue unless stained enamel can be bleached by external applications.

Such a method of bleaching enamel was employed by me over two

years ago in an endeavor to restore the color of teeth in which porcelain inlays were to be placed, but since that time the same method has been successfully used to remove permanent stains in the apparently sound enamel of teeth with living pulps, and to remove the germs of general superficial decay where fillings heretofore had proved unable to withstand the attacks of the bacteria.

Cases from Practice.—I have in mind one patient the necks of whose teeth were literally covered by superficial decay. The gums were extremely sensitive; fillings had to be replaced every six months, each time larger than before; mouth washes proved valuable for the soft tissues, but from their lack of penetrating power were useless in retarding the enamel decay. It took five visits to thoroughly sterilize all of his teeth, when the enamel looked normal, the gums became healthy, and to my surprise, the patient volunteered the information that the teeth were much less sensitive. This was especially interesting, as I had thought the method might possess the drawback of making the pulps temporarily more sensitive.

Another patient came to me with his teeth covered with the well-known green stain. Ordinary polishing and brushing proved useless, as the enamel had been pock-marked by measles during childhood. We all know what esthetic trouble these pock-marked teeth give us, not so much from the inequality, but from the stains at the bottom of the depressions that it seems impossible to remove. A single treatment to the central, lateral and cuspid made the stain melt from sight, the enamel became normal in color, and by the use of brushes and mouth washes remained so.

Method of Bleaching with Pyrozone.—Peroxid of hydrogen and peroxid of sodium when heated give off oxygen in great quantities. This nascent oxygen at the moment when it leaves the compound is most caustic, and therefore if we can liberate this gas directly on a tooth we shall be able to remove any organic stain. Either pyrozone, which is a 25 per cent solution of peroxid of hydrogen, or sodium dioxid can be used. These two materials seem equally powerful, but they are somewhat different in their actions, and would therefore better be described separately.

If the stained tooth is pulpless and the apical ends of the canals have been tightly sealed, the treatment should be as follows: Apply the rubber dam and tie one if not two ligatures around the neck, so that leakage is impossible. Let the rubber dam go slightly over

the nostrils of the patient to prevent the fumes of the nascent oxygen from irritating the air passages. Oil should be rubbed on the hands of the operator and on the face of the patient. The tooth should be dried internally and externally. Cotton soaked in pyrozone should be packed in the canal and a hot ball burnisher, such as is used in plastic work, should be placed against the cotton, so that the steam of the nascent oxygen will be driven through the tooth substance. After the cotton becomes dry it should be removed, and the tooth heated again internally with hot air, when the process described above can be repeated several times. Finally, cotton soaked in pyrozone should be sealed in the canal with hard gutta-percha, so that any gas that is given off may by pressure be driven throughout the dental tubules.

Then we are ready for the second stage of the process. The enamel should be thoroughly dried with hot air blasts and heated instruments until the patient feels the heat of the tooth in the gum. This makes the oxygen within the tooth canal exert great pressure; then a piece of cotton soaked in pyrozone should be placed on the enamel, and a broad, hot instrument held against it, so that the steam shall be driven in from the outside. This should be continued until the cotton becomes dry, when the enamel should be ironed with a highly heated ball burnisher. This drives out the pyrozone that the enamel has soaked up, and in driving it out liberates the nascent oxygen within the enamel substance. The effect of this last-mentioned ironing is most marked and the stains can be seen to whiten perceptibly. This process can be repeated in its various stages as often as desirable, and when the patient leaves, fresh pyrozone should be sealed in the canal with gutta-percha, in order that the bleaching process may continue until the next visit. If finally there is a slight stain that the nascent oxygen will not remove, a strong solution of oxalic acid should be used in the same way. The oxalic acid is not only a powerful oxidizer of organic material, but will also change any iron stain to a colorless oxalate.

Peroxid of Sodium Method.—What has been said about the use of pyrozone, with a few cautions applies equally well to peroxid of sodium, as both bleach primarily by setting free nascent oxygen. The peroxid of sodium is most valuable where oil in the tooth is to be saponified, and it will therefore sometimes succeed where pyrozone fails; however, we must remember that when peroxid of

sodium touches the soft tissues it makes a deep burn, which pyrozone would not, and therefore great care should always be taken that the sodium dioxid does not escape from the protection of the rubber dam. When this compound is placed in hot water the oxygen is given off so rapidly that a distinct puff is heard, but when it is melted on ice a thick paste of the undischarged sodium dioxid can be obtained, which when placed upon the dried enamel and heated with a hot instrument will safely give off a tremendous quantity of nascent oxygen. This oxygen, as previously stated, will bleach the enamel of a tooth where the pulp is alive. When peroxid of sodium has been used it should be carefully washed off with water and neutralized with a weak acid. Before the rubber dam is removed, always be sure that none is left to burn the mouth. For the same reason it is also dangerous to seal it up in a tooth canal unless the utmost precautions are taken against its escape.

Dr. Miller has, I believe, noted that concentrated peroxid of hydrogen under certain conditions may attack the organic matrix that holds the enamel rods together. This is a warning that should be noted and considered. But in spite of this warning, the good results obtained by me might be explained, even though Dr. Miller's observations were generally true. Enamel that is sterilized of its infecting bacteria is better able to preserve its integrity by the use of antiseptic washes, even though the matrix may have been slightly weakened by the bleaching agent, than infected enamel, the matrix of which is being constantly thinned by bacteria that lie too deep for an ordinary wash to reach. But whether this method even theoretically injures the enamel is a subject for future research. This much, however, is sure—the method presented to-night has permanently bleached stained enamel and that enamel has kept its normal color and integrity for over two years.—*Items, March, 1902.*

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SEVEN CONDITIONS THAT BRING ABOUT OPPORTUNITIES FOR THE FAILURE OF DENTAL OPERATIONS. By Dr. E. K. Wedelstaedt, St. Paul. Read before the Minnesota State Dental Association, 1901. The results of the investigations of the cause of decay of the human teeth, to which our attention has been called by the researches of Drs. Black and Williams, have generally been accepted by all intelligent dentists. We now know definitely when a cavity in a tooth is prepared and filled without

altering the conditions which led to the first decay that it is but a question of time before recurrence of decay takes place. Where there is not an alteration in the conditions which led to the disease an opportunity is left. In such cases it is simply useless to do the work, for failure is but a question of time; this applies to surgical as well as to dental operations. The question can well be asked, what is meant by this term "opportunity"? I will answer this by saying that it is one of a number of conditions to which I now invite your consideration. My remarks will deal principally with the proximal surfaces of teeth where fillings have been made, and where it is supposed that there is an adjoining tooth in position. Cavity preparation will not be considered, for all should now know what constitutes correct cavity preparation.

What is an opportunity? It is 1st. A margin which is not tight, i. e., an opening between the filling and the cavo-enamel margin. 2d. An overhanging gingival margin of filling material which is or is not protected by a healthy gum septum. 3d. A rough margin. 4th. A margin which has been trimmed too much. 5th. Retention centers. 6th. Noncontouring of the interproximal space, and 7th. Any place around a filling or margin that will catch and hold the food.

1st. A margin which is not tight. I believe that 90 per cent of the fillings which are made in the proximal surfaces of bicusps and molars with cohesive gold do not have tight margins. This condition is caused by the methods used in packing gold. You may be somewhat surprised if you will observe the way gold springs away from the margin while you are packing it into the cavities in the mesial or distal surfaces of incisors. If we look for the cause of this springing away it can be found in the method employed in placing and malleting the filling material. Much care should be exercised in placing properly and condensing thoroughly each piece as it is inserted. If the eyes are used as they should be, they will quickly aid in overcoming the causes which lead to leaving ditches at some portion of our margins. Where cohesive gold is used for filling cavities in the proximal surfaces of bicusps and molars, unusual care must be exercised in placing the filling material or an opportunity is left which later on leads to failure.

2d. An overhanging gingival margin of filling material which is or is not protected by a healthy gum septum. This is simply a shelf on the filling which serves to retain or hold food which under-

goes changes in its composition, with the inevitable result of having recurrence of decay take place. Where a margin is tight and not covered with a healthy gum septum, but has a ledge of filling material at the gingiva, it is but a question of a very short time before there is a cavity of decay beside that margin. Where, however, this overhanging ledge of filling material is protected by a healthy gum septum it is simply an opportunity that naturally tends to cause an irritation, which leads to the absorption of the gum in the interdental space and an unhealthy gum septum results. It is not alleged that absorption immediately takes place, for we all know that such conditions have existed for years and apparently little harm has been done, but they are conditions which bring about opportunities for evil, and should be done away with. And while on this subject let me impress upon your minds the necessity of removing these overhanging shelves of filling material, as they are conditions which lead to the undoing of our work. The fact that some of the manufacturers have, on the cards accompanying their alloys, the statement that it is not necessary to polish the amalgam fillings made from those alloys, is absolutely unworthy of any consideration. It is as necessary to polish amalgam fillings as it is those made of gold. Another thing, the fees charged by a number of men for amalgam work are so small that many men assert they cannot afford to polish the amalgam fillings they make. It is not the intention of your essayist to do otherwise than adhere strictly to the subject in hand, but for the benefit of those who make such assertions I desire to say that all intelligent men look with horror on those members in our profession who follow methods of the kind just described. As a rule, it is far more difficult to finish properly an amalgam filling than one made of any other material. It always takes me a longer time to finish an amalgam filling made in the proximal surface of a tooth that has an adjoining tooth in position than it does to prepare the cavity and make the filling. It does not make any difference whether the material used in filling a cavity is gold, amalgam or cement; it should be properly polished and in so far as possible all conditions that lead to opportunities should be done away with.

3d. A rough margin. Rough margins are frequently the result of carelessness in packing filling material against margins which have been either properly or improperly trimmed. This has a tend-

ency to break up the original marginal form and then it is practically impossible to so pack the filling material that a tight margin results.

4th. A margin which has been trimmed too much. If you will take a No. 1, a No. 1½ and a No. 2 sandpaper disc, and so hold them that you can look across their cutting surface, you may be a little surprised at the inequalities which you will find. In proportion as the coarseness of sandpaper discs is increased above No. 1, so in the same ratio is there an increase in the roughness and inequalities of their cutting surface. The same is also true regarding the cutting surface of polishing strips. These coarse discs and strips have a tendency to cut minute grooves and hollows in the tooth around the margins of our fillings. These grooves and hollows are unequal in their depth, consequently when the final polishing is completed an opportunity is left for the attachment of microorganisms. With this opportunity at hand the surface of that tooth is placed in a condition where it is but a question of time before recurrence of decay takes place. In finishing fillings made in the proximal surfaces of teeth it is a very common practice to see men, who should know better, run a flat file or a rotary disc completely between the teeth from the occlusal to the gingival margin. Where this practice is followed, not only is the point of contact on filling cut away, but a hollow is often left in the filling or in the gingival margin. Frequently the gingival margin itself is so reduced by this condition that an opportunity is created which also leads to the failure of our work. I am perfectly aware that there are those who still contend that the rotary disc is the most rapid means (and some assert the only method to employ) for the reduction of a filling, and I am perfectly willing to acknowledge that there is some truth regarding its being a rapid means. But from the amount of havoc and opportunities for recurrence created by its use I am amazed at the courage which so many have in deliberately publishing their convictions. It is our duty to study the conditions produced by the use of the rotary disc and to carefully compare these conditions with those which are obtained by more rational and scientific methods.

5th. Retention centers. Those who are interested in retention centers can gain much knowledge by reading Dr. Miller's essay in the *Cosmos* for April, 1900. It fully bears out the idea to which

attention was called by Dr. Black in 1891, that all cavities in the proximal surfaces of teeth must have their lingual and buccal margins extended past all contact with the adjoining tooth. I agree with Dr. Ottolengui, that all fillings should have a looking-glass finish. They should be free from pits and hollows, as these are simply "yeast ditches," as Dr. Searl has named them. The tendency of these pits is to assist in retaining food which will cause decay in the surface of the adjoining tooth if it has not already started. Since I wrote this a woman consulted me regarding the condition of the distal surface of the upper left second molar. She said that after each meal it was necessary to remove the food from the interproximal space, and this could be accomplished only with much difficulty. The mesio-occlusal surface of the upper left third molar contained an amalgam filling which to all appearances had been nicely polished, that is, the portion of the amalgam that was reflected in the mirror was very bright. When I attempted to pass an instrument through the interproximal space it struck some obstacle. On examining the condition of the filling with a little more care I found that that part of it which could be reached readily with a rotary disc had been polished, but the mesial surface had not been polished. Space between the teeth was obtained. A cavity of decay was found in the distal surface of the second molar and on the face of the mesial surface of amalgam were three distinct ditches. These ditches ran across the face of the amalgam from the lingual toward the buccal, and they were not less than .5 millimeters deep (estimated.) The cavity of decay in the distal surface of the second molar was directly opposite these ditches. The patient asked, "Why did that tooth decay?" The condition of the mesial surface of the amalgam filling was pointed out to her and she quickly understood what was meant by the term "retention centers," and how those ditches could hold the food. The man who originally made this work is well and favorably known to all of us. He knows full well or he should know what harm untrimmed and unpolished amalgam fillings are likely to do. The fact that the fillings in the locality just described are so difficult to finish on account of their being so inaccessible is no excuse for leaving a filling in this condition.

My object in calling your attention to this particular case is twofold. 1st It at once fixes firmly in your minds what a retention center is and the harm it can do, and 2d. I would most respectfully

suggest, where there are a number of operations to make, that everybody make it a rule to finish completely each operation before doing any other work for the patient. For years I have followed this method, but notwithstanding the fact that I have impressed on the minds of my patients the necessity of having these fillings polished, there must be a couple of hundred of them remaining unpolished. The patient is wholly to blame for this state of affairs. We cannot be responsible for dereliction on the part of our patients, but I do think that we can very materially alter the state of affairs that exists at present by finishing completely all work before commencing any other operations.

6th. Noncontouring of the interproximal space. If the proximal surface of a filling is not contoured properly the interproximal space is not contoured as it should be. The result is that food is held in that space and is a menace to the stability of the rest of the teeth. The proximal surface of a filling should be so trimmed that it slopes in all directions from the contact point. It will then be impossible for food to be retained in that space. Not until 1897 was there anything said about the importance of giving the interproximal space a proper contour. In that year Dr. Black in a very able essay called our attention to the importance and the necessity for finishing all operations on the proximal surfaces in such a manner that the interproximal space should be properly contoured. Since 1897 less than half a dozen writers have seemed to think this subject worthy of their attention. As we observe conditions we quickly realize what an alteration in them does for our patients, and the more time we spend in studying what constitutes a proper contour for the interproximal space, the more impressed we are with the importance of this subject. Others are also beginning to recognize the importance of this matter. In the DENTAL DIGEST for April, 1901, can be found an illustrated essay by Dr. J. R. Clayton of Shelbyville, Ind. The subject is "A Study of the Interdental Space, Loss and Restoration." The ideas presented are worthy of much thought and still more study, and if these are given Dr. Clayton's essay, the views of some persons regarding the importance of properly contouring the interproximal space may undergo a radical change. I am of the opinion that where the contour of the interproximal space is ignored it is in many cases the direct cause of disease. If it is not a direct cause, it surely aids and assists disease. These ill-trimmed

spaces are a greater factor, at least so I believe, in producing and aiding disease than we at present recognize or are willing to take into consideration. The food crowds into these spaces, is held there and undergoes changes in its composition. This keeps the interproximal space in an unhygienic condition. Such conditions always invite disease. As our knowledge of bacteriology is increased, so also will our ideas of this subject change for the better and we will more fully recognize what an opportunity for evil a noncontoured interproximal space is. I cannot emphasize too strongly the importance of studying this subject with much more care than has ever been given it in the past. It is impossible for us to advance beyond our present narrow limits unless we begin to consider this subject as it should be considered and to study the conditions as they should be studied.

7th. Any place around a filling which will catch and hold the food. As our knowledge of the conditions which lead to the failure of our work has been developed, so has our knowledge of the importance of trimming properly all fillings and cavity margins been increased. A man of intelligence who has made a study of the conditions as they have been developed for our consideration can now only examine the condition of the cavity margins after filling to tell just about how long that tooth will remain as it is. Such a person merely watches an operator work for a few moments to know definitely whether or not tight margins are being made. He has but to examine the cavity margins prior to placing the filling material in order to be in a position to speak authoritatively regarding the possibilities of making a good operation in that particular case. Now with our knowledge of the conditions developed to this extent it should be the aim of all in our profession to become very familiar with this knowledge and these conditions, so that no opportunities for holding food are ever left around the margins of our cavities. All should familiarize themselves with the conditions that lead to the failure of our work, and it is the duty of all to obtain an intimate knowledge of those which do harm. Then they can be altered and done away with when the operations are made, and failures will not be so likely to take place.—*Review, April, 1902.*

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RESORPTION OF DENTAL STRUCTURES. By Otto E. Inglis, D.D.S., Philadelphia. The hard structures of the teeth are all subject under certain conditions to the action of certain cells,

known as giant cells, which remove them entirely or in part, there being nothing left of the part acted upon of the nature of decalcified structure such as occurs in caries. A resorbed root, for example, presents for examination a morbid condition, in which a portion of both cementum and dentin have been removed, leaving a more or less roughened but comparative plain surface, or deep, bay-like excavations with roughened edges, or a spiculated condition of the root end. The first of these phases of the condition seems dependent upon some form of pressure which is regularly maintained, as, for example, by a permanent successor to a deciduous tooth. The last two phases are seemingly the result of morbid processes set up in the soft tissues surrounding cementum or enamel, and which produce a soft structure apparently analogous to granulation tissue, by the contained cells of which the process is continued.

The removal of the deciduous teeth for the accommodation of their permanent successors and the bay-like resorption of enamel and dentin in permanent teeth are classed respectively as physiological and pathological processes, and seemingly are conditions widely different; but it is quite likely that the difference in the grades of irritation produced and which lead to the results are more apparent than real.

Another form of dental resorption occurs within the pulp-canal, when a similar grade of irritation is produced in the pulp either of a permanent or deciduous tooth. Again, granulation tissue (so called for want of better information) is produced and the dentinal wall of the pulp cavity is resorbed even to the extent of removal of the entire coronal dentin, with a consequent weakening of the enamel or the perforation of either enamel or cementum, or both at once.

In all cases of resorption examination may reveal the papilla-like overgrowth of the soft tissues existing either at the location of the bay of resorption on the outside of the root or crown, or within the tooth.

Examples of all these conditions exist or have been reported, and a summary of important cases may serve to further elucidate the principles involved. Deciduous tooth-crowns, after extraction for looseness, have been found to contain bay-like resorption of the crown dentin. In one extreme case the enamel of the crown of a cuspid alone remained intact. In still another case the coronal

dentin was largely resorbed and the tooth perforated laterally at the junction of the enamel and cementum, both having been slightly removed. In this case the tooth was seen *in situ*, and presented the appearance of a suffused tooth. When extracted the crown was seen to contain the resorbent organ in the place of the pulp. The removal of this restored the normal color of the tooth, and brought to light the neat round opening at the cervix. All are familiar with the fact that pressure of advancing permanent teeth produces resorption of the deciduous roots also; that when the pressure is upon the root end the root is regularly removed; when at the side one side is stripped off, as it were, by resorption, while when the pressure is lacking or only partial the tooth often remains *in situ* for years. This often occurs when the permanent laterals are lacking, and the permanent cuspids erupt anteriorly or posteriorly to the deciduous cuspids. Why in these cases the enamel of the permanent tooth is not affected by the resorbent organ is difficult of explanation, but it is not. Mr. Tomes explains resorption of deciduous roots upon the theory of a vital process, or a sort of predestination of tissues, supporting his opinion by the fact that tooth roots may resorb, leaving perfect bony sockets before their successors are ready to erupt. No doubt developmental tendencies are vital processes and must be considered in connection with associated destructions.

There are, however, numerous instances of resorption of permanent roots after the manner of the deciduous roots. The resorption in these cases occurs at the pressure point. A case in point is that of an upper third molar, which after extraction was found minus its buccal roots. Search revealed a supernumerary molar, the crown of which exactly fitted the area of resorption upon the end of the buccal roots.

The resorption of permanent roots presents the peculiar bays or spiculated conditions previously described. The bays may be localized, and single or multiple, but all are probably due to aseptic irritation, with the possible exception of cases due to chronic abscess, and in these I believe that the resorption occurs during a temporary lull in pus formation. I have no doubt that it occurs from the aforesaid granulation tissue, which can touch a root only when it is capable of repairing the loss of its substance as fast as pus germs break it down. Whether the giant cells in granulation tissue can

act upon tooth-substance while pus is present seems doubtful when the restraining action of pus formation upon resorption of deciduous teeth is considered.

Other specific causes of resorption of permanent roots are plantations, protruding root-fillings, protruding broaches, calculus, chronic pericemental irritations, such as are produced by chronic looseness which really produces pericemental overwork. In some cases there seems to be no explanation of the causes of the resorption of a number of the roots of the permanent teeth of one individual, though no doubt some form of irritation is present.

Impacted teeth, a cuspid for example, may have their enamel and underlying dentin resorbed, the proof of resorbent action lying in the fact that the said tooth was removed before eruption. A very peculiar case of resorption was recently exhibited by Dr. A. P. Fellows, at a meeting of the Academy of Stomatology of Philadelphia. A central incisor taken from the mouth of an elderly lady exhibited a resorption of the entire apical half of the root. The remaining half was hollowed out by resorbent action, the cementum being intact. The location of the original pulp canal was occupied by a column of secondary dentin, which had proven more resistant of resorption than the normal dentin.—*Stomatologist, April, 1902.*

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ORTHODONTIA AND ITS RELATION TO TEMPERAMENT. By Eben M. Flagg, D.D.S., Philadelphia. Read before the Southern Dental Society of New Jersey, March 19, 1902. The increasing importance of the science of orthodontia prompts me to put forward a few ideas in its relation to temperament, in order to show the necessity of making our operations harmonize with those individual peculiarities which would characterize the patient, presuming his or her denture to have erupted with normal occlusion, and at the outset I cannot too strongly impress upon you the necessity of always having at hand models of normal mouths for constant reference and study. The model of a normal mouth seems to be one of the rarest possessions of a dental establishment, and yet as there can be no effective study of pathology without first a thorough knowledge of physiology, so any attempt to correct oral deformity without first being well disciplined in a knowledge of correct dental occlusion must end in dissatisfaction to the operator and probable mutilation to the patient, one species of deformity

merely being replaced by another, and all because the operator had not appreciated the fact that there is not an elevation nor a depression throughout the whole denture, upper or lower, that has not its corresponding counterpart made to fit into it and no other.

Errors of Extraction.—When a patient presents for an operation in orthodontia, what has generally been the first consideration in the case? Almost invariably it has been, "Let us see what teeth we can extract in order to make room." I repeat, "to make room," for that has been the usual expression, and the making of room has really been only the decrease of room. Dental arches already too much narrowed for speech, beauty or mastication have thus generally been corrected (?) by making them still narrower, and facial contours already too diminutive have thus been restored (?) by being made still more diminutive. In this matter we as dentists are not altogether to blame. We have worked according to our light, which has been so dim heretofore that we did not see what far-reaching results could come of an operation which seemed to be confined merely to the teeth. Now, however, we see that the basis of our etiology is being shifted, and if I am anything of a prophet, I predict that "crooked teeth" will soon be demonstrated to be nothing more than an outward and visible sign of an inward and constitutional disturbance; that the face is not pinched and deformed because the teeth are irregular, but an antecedent lack of development in the face has been the cause and not the effect of the oral deformity.

Etiological Factors in Irregularities.—The human head and face in their mechanical construction may be likened to a series of arches. The brain cavity from its shape is made so as to resist enormous external pressure, not only from above and the sides, but also from below, so any undue pressure upon the brain cavity in order to induce morphological changes must come from within rather than without. During adult life such pressure results in apoplexy, and cerebral engorgement is almost sure to produce death. The abnormally increased blood supply brings about a strangulation, from which the patient may or may not recover. Such, however, is not the case with very young patients. With them cerebral strain may cause an undue enlargement of the brain cavity, the bones of the head at a very early age being more yielding, and no part of the human system may preponderate except to the detriment of some other part.

Let us see what part or parts are most likely to be impaired by the condition which we are just considering. The abnormal flow of blood to the young brain that is sure to be occasioned by severe mental tasks, overexcitement, late hours, or errors in diet, must be felt mostly at the cerebrum, since that is the seat of intellectual function, and it is this portion of the brain which is situated just above the external bones of the face. Now, the anterior portion of the floor of the cerebral cavity seems to be more scale-like or squamous than any other portion. It has not the dense double layers that the parietal, frontal and occipital portions have; thus an undue pressure would be more likely to make the anterior portion of the floor of the cerebral cavity yield. So much for the dynamics of the case.

Outside of dynamical considerations, we must not lose sight of our former proposition, that an unduly excited part, when it does not succumb to the excitement, preponderates to the detriment of some other part, just as a growing tumor starves surrounding tissues, and an abnormally increased blood supply at any given part, while causing defective development even at a distance from a point of observation, does still more mischief at points contiguous, in that to the general weakening is superadded the dynamic influence already noted. It is difficult to say just at what age this train of evils may have had its origin, whether in the tender years of childhood, or through maternal impression *in utero*, but of one thing we may be pretty certain, that the cause of degeneration, as I have stated it, is in accordance of well known rules of pathology, and does much to account for the puny, undeveloped faces of those patients who come to us for treatment of oral deformities.

The arches of the cranium having been considered, let us now consider the arches of the face; and there are many of them, since anything constructed to resist external pressure must take the form of an arch. There are the convolutions of the turbinated bones, the dome of the antrum, the arches of the superior maxillæ, palatal and dental, all of which are constructed to best resist external pressure, with a minimum of material occupied in their construction; besides we have to consider the nasal septum, which is braced above and below by what appear to serve as two keystones, namely, the crest of the ethmoid and the wedge of the former where it fits in between the palatal bones; but with the pressure downward

from above, which I have mentioned, combined with the starved condition of the upper face resulting from defective blood supply and the constant hammering of the inferior maxillary from below, these keystones often prove of no avail; the septum becomes deflected; the vault of the hard palate narrowed and pointed upward; the teeth thrown into irregularities or thrust forward, the lower jaw protruded or undershot; all the horrors of mouth-breathing inaugurated, and adenoid growths alternate with rhinitis and nasal catarrh. I have not time to elaborate this matter here, but to those who would see the details of the process scientifically put forth, I would recommend them to read an article on deflected and

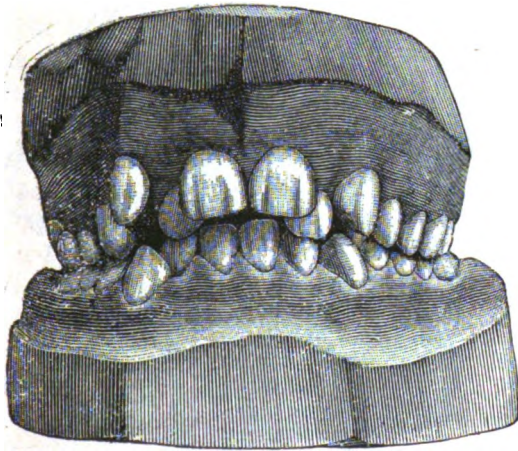


Fig. 1.

deformed nasal septa by Nelson M. Black, M.D., and published in *American Medicine*, under date of February 15, 1902, for it is one with which every orthodontist should make himself familiar.

Thumb-Sucking. If our course of reasoning up to the present time has been correct, it will be acknowledged that the lower jaw is thus the last link in a long chain of deformities. In reaching for an occlusion to the narrowed superior denture, it is often thrust forward, but generally pulled backward by the patient, and as this backward pull is irksome, the suffering child seeks to aid it by thrusting the thumb into the mouth and using the upper incisors as a fulcrum, thus assisting the lower jaw to its backward position. Needless to say, this thumb-sucking aggravates the deformity. In

case the lower incisors bear well against one another, then the arch will not yield and the lower jaw is carried back bodily, but if the thumb-sucking takes place at an age when the lower arch is not well braced, then the lower incisors are forced so far backward that they will fall well behind the cuspids, and it is easy to decide whether it is the right thumb or the left thumb which has been sucked by noting on which side the displacement of the incisors is greater. In the models which I now pass around, it is the right thumb which has been sucked. (Figs. 1 and 2.)

In reducing the deformity our first care is to see that the cause is removed. The child must be relieved of all mental strain, and its

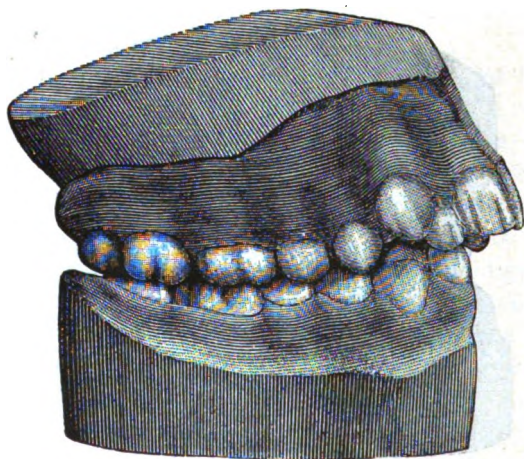


Fig. 2.

general system carefully restored by bathing; massage, exercise, etc., while one of the distorted dental arches must be restored by mechanico-chirurgical means. The lower one is preferably the first to be corrected.

I will not take up your time with a consideration of mechanism, as I wish to call attention to the philosophic bearings of this question rather than the mechanical, and most of the members of this society are doubtless familiar with all the mechanical contrivances in vogue for the reduction of these deformities. What I wish is to lay particular stress upon this point that, in restoring the face and jaws to beauty and usefulness, we are to consider carefully the kind of arch to be obtained in conformity with the temperament of the

patient, and not to think that any one curve or shape of arch is ideal to all cases.

Lymphatic Temperament. In the matter of the lymphatic temperament there is not much to be said. Where it predominates the patient is not often afflicted with dental irregularities, but I have noticed a peculiar condition in the lymphatico-nervous patient. The signs of this temperament as given by Prof. J. Foster Flagg are: "Average size. Less than average osseous and muscular, but more than average contour development. Complexion, dark or light, but generally devoid of freshness or coloring. Cheeks, inclined to be full, prominent, rounded. Forehead, broad and high; jaws, average; chin, small, well formed. Hair, medium in color, but straight or at most slightly wavy, beard sometimes almost wanting. Eyebrows, not marked nor arched. Mouth, average or small; lips, fairly full. Nose, average, somewhat decided in contour. Color and structure of teeth, grayish blue, soft and frequently quite sensitive. Size and form of teeth, average or less than average size, shapely with rounded arch." The peculiarity of the deformity that I have noticed in this temperament is that the teeth instead of being overcrowded are often widely separated, which to my mind constitutes a deformity quite as pronounced as where the teeth are crowded and overlapped. As nothing has ever been proposed to reduce this species of deformity, we will not discuss it here, but pass on to a consideration of the nervous temperament.

Nervous Temperament. The indications of this temperament are as follows in relation to the teeth: General color and quality of color, pearl blue or gray inclined to transparency. General form, length predominating over breadth, firm, long cutting edges and cusps. Surface of the teeth, brilliant and transparent, depressions and elevations abounding in long curves. Occlusion, very long and penetrating. Gum margin or festoon, delicate, shapely and fine, oval in curve. Facial contour, delicately oval. Dental arches, rather narrow. Now, if we attempt to restore the dental arch of a patient where the nervous temperament predominates, without taking into account the various indications which harmonize with that temperament, as just stated, it is easy to understand that we may produce a result quite at variance with what should be the proper expression of the face of the patient.

Bilious Temperament. With the patient of bilious tempera-

ment we have the indications quite different from those where the nervous temperament predominates. Here we have all the lines strong, firm and rugged, just in proportion as the bilious predominates. In general form the patient is tall, angular and squarely built. The muscles knotty, prominent, hard and tense. The chest, capacious and of good expansive power. The forehead and cranium square. The facial contour angular, with cheek bones high. In the dental arch, the cuspids are large and prominent, and the arch itself is broad and deep, though deficient in anterior curve. An attempt to make such an arch with a delicate oval curve, as in the nervous temperament, would weaken the expression of the face and be entirely out of keeping with every other feature.

So again with those patients of sanguineous temperament we have points of contrast from both the nervous and bilious types. Here we have a patient whose general framework is of firmly rounded contour, medium height and robust. The forehead and cranium rounding and full. The facial contour decidedly round, of which roundness the dental arches fully partake at their anterior portion.

Makers of regulating apparatus may provide us with arch bars more or less resembling the human dental arch, but they cannot make any one shape, guaranteed to fit the temperament of every patient. It remains with us as artists to see that we study well the temperament of our patients before beginning the operation, so that when the movement of the teeth has so far progressed that the case is ready for the arch bar and finishing touches, we may recognize the kind of curve that should be given to the dental arches in order that they may harmonize with the facial contour belonging to the patient by right of temperament, or else we may find that we have not restored a lost expression, but merely substituted one class of deformity for another.—*Items, June, 1902.*

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HEREDITARY SYPHILIS. In an article on malformations of the jaws and teeth in hereditary syphilis (*Gazette des Hôpitaux*) Dr. A. Brunet points out a sign which he considers of great value for correctly diagnosing this affection. After first stating that many of the phenomena exhibited by the teeth of those known to be syphilitic are also met with in other diseases, and that certain malformations of the jaws, as prognathism and arched palate, are

rather to be regarded as signs of degeneracy, he asks whether there be any lesions of these structures which may be regarded as presumptive evidence of hereditary syphilis. He says that it is established that erosion of the first molar, especially the lower first molar, furnishes a sign of great value for this purpose. The reason for this is found in the fact that the first molar of the second dentition is the only tooth the ossification of which begins *in utero*. This tooth is ossified and covered with its cap of dentin at the sixth month of intrauterine life. An erosion, according to this author, is a lesion which occurs at the time of formation of a tooth and is due to a momentary interruption of this process. An erosion of a molar tooth is an hereditary fetal affection having as its cause a diathesis capable of acting during intrauterine life. Now syphilis especially exercises such influence. Erosion, then, of the lower first molar in a patient whose other teeth are healthy is, he says, a pathognomic sign of hereditary syphilis. Hutchinson's teeth and the screw-driver shape of the upper median incisors, the ossification of which begins the first month after birth, can also be seriously regarded as presumptive evidences of the influence of hereditary syphilis.

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COLOR AND SHAPE OF THE TEETH AND A SUGGESTED OPERATION. By J. Sim Wallace, London. The general appearance of the teeth is a point in which we as dentists presumably take a special interest. Mr. Tomes says: "I am firmly convinced that I can recognize a type of tooth at a glance which is specially prone to decay." And again: "It is quite common to meet with instances of healthy parents with good teeth bearing a family of children apparently healthy and well grown, whose teeth, although to the casual observer normal in shape, size and general aspect, are to the eye of the dentist doomed to early destruction, and speedily undergo it. These teeth have an appearance somewhat difficult to describe; they have a glassy look, are more translucent than they should be, are softer, and are believed, though the proof is not complete, to be somewhat deficient in their proper proportion of lime salts."

Messrs. Smale and Colyer seem also to believe in the two kinds of enamel. They say: "It is difficult to believe that the bluish translucent enamel and the dense yellowish enamel are identical in structure. The researches [Dr. Black's] enumerated do not by any means conclusively prove that there are no characteristics in the tooth structure which give teeth different powers of resistance."

These extracts will remind the reader of current views. I wish to draw attention to the fact, as I take it, that it is not necessary to assume the existence of two different kinds of enamel, or to insinuate—although there is not any discoverable chemical difference—that there may probably be a molecular difference, or a difference due to a greater or less amount of water of crystallization.

Let us consider first what is in general the color of enamel alone. Is it not of a bluish translucent appearance? Now if this is thick on any particular tooth the tendency for the tooth to present this appearance will be marked; on the other hand, when the enamel is well worn off the dentin it will be highly polished, and the dense yellowish appearance of the underlying dentin will predominate. Then, again, teeth which are well worn with use are kept free from caries by the continual friction of coarse and fibrous food. They do not resist decay on account of their own structure, but because of the environment in which they are placed. The case is different when the enamel remains thick. Here we have to deal with teeth which are not much used, or not much worn down. The friction and cleansing action of coarse and fibrous food is absent, and consequently the teeth are liable to become carious from the lodging of food and microorganisms. The teeth are not "prone to decay," but the environment in which they exist is prone to set up and continue decay. I am firmly convinced that I cannot recognize a type of tooth which is doomed to early destruction, except it be malformed. I would also point out that the different types of teeth referred to do not exist on eruption, but take on their typical characters only after they have been subjected to the action of their respective environments for some considerable time.

Even grossly malformed teeth with ill-developed enamel will, under certain environmental conditions, resist decay, and after a little attention to the environment of the teeth one can recognize a type of environment which will decay any teeth whatever. Should anyone wish to verify the above experimentally it is easily done. Take, for example, an incisor tooth of ordinary color, which will be more or less yellow, especially towards the neck where the enamel is thin, and gradually becoming rather bluish and translucent towards the cutting edge where the enamel is thick: With a carborundum wheel in the engine remove a considerable amount of the bluish translucent part (otherwise the enamel) and the tooth

will become more of the dense yellowish type. Like many other facts, this one requires only to be pointed out. There are no doubt other causes for slight differences in color. It is, however, my intention here to refer only to the two main colors which have been recognized and the significance and importance of their appearances.

As regards the shape of teeth, I think there is a shape of tooth which is normal yet is generally unrecognized as such; while on the other hand teeth are supposed to be normal in shape when they are wholly abnormal. For example, it may be asked, What is the shape of a normal first molar in an adult of normal constitution? In this degenerate age the answer would be something like "Its grinding surface presents five cusps. Four cusps are placed regularly at the four corners of a square, these being divided from one another by a crucial fissure," etc. This description is, of course, totally incorrect, however accurate it may be for the erupting tooth. However, make the description as nearly the opposite as possible, and you will much more accurately describe the form of a normal adult's lower first molar. Let it read, "Its grinding surface presents five little hollows. Four cup-shaped depressions are placed irregularly at the four corners of a square, these being divided from one another by a crucial ridge," etc. I need not elaborate this description. The point upon which I wish to insist, for it is of great importance, is that the grinding surface of a tooth ought under normal circumstances to show signs of wear greater or less according to the time the tooth has been in use. It is difficult to see how, for example, the first lower molar could possibly retain its deep crevices into adult life without running serious risks of lodging sufficient food and microorganisms to initiate caries; whereas, if a coarse and fibrous or otherwise normal diet is taken, not only are the crevices kept relatively clean, but the cusps are worn down and the crevices become correspondingly shallower and less liable to lodge food; indeed, as the cusps get worn away first and the dentin is softer than the enamel, the crevices which are so susceptible to decay become somewhat more elevated than the surrounding cup-shaped depressions, and so less susceptible to caries.

I may here refer to some articles which have been recently appearing in our dental journals about "immune areas" in teeth, but the parts of a tooth are susceptible to caries solely in direct proportion to the lodgeability of food and microorganisms, except at the edge

of the gum, where the tooth has the special protection of the alkaline secretion which is poured out round the root of the tooth. The articles referred to originate in the fallacious belief that the predisposition to caries exists in the tooth structure itself, and consequently they are rather a waste of printer's ink.

Let us now revert to the wearing down of the cusps of the teeth. Notwithstanding the fact that it is generally treated of as a disease, it is, as I have said, a normal process. This may be seen by reference to the skulls of any race which has not lived more especially on refined food and slops. I think this wearing down of the cusps indicates a possible method of preventing caries. I refer to grinding down the cusps of the teeth little by little to do the work that the food ought to have done. The points to which the carborundum wheels require to be applied can easily be marked with articulating paper. This operation should be performed on all the lower teeth at once, or on all the upper teeth except the front six and the lower front six teeth, so that at the end of any one sitting the teeth will all articulate. If one or a few teeth are done at a time they will rise in their sockets till they meet the occluding teeth, but this is not desirable, because inasmuch as the vertical site of the mouth is diminished by the operation, to that extent must the lateral diameter be increased by the lateral pressure of the tongue. This operation is useful also for the temporary teeth. Possibly the softness of the enamel in the temporary teeth suggests the operation more imperatively. I have no doubt the ease with which attrition takes place in temporary teeth indicates a special provision for their protection from decay. I think there is no evidence whatever for the belief that hard enamel is more resistant to caries than soft. The evidence indicates the reverse conclusion.

The cases in which this operation of decuspitation is most suitable are those, for example, where incipient caries threatens the masticating surfaces of the molars and bicuspid and where there is a slight crowding of the teeth. Such cases frequently present themselves either with or without actual caries in one or more of the teeth. The operation can be performed on single teeth, but with less advantage and more danger.

All such operations should be accompanied by instructions as to diet. A coarse and fibrous diet would, of course, supplement the operator's treatment. I may here add that it should be the aim of

the operator to give the patient such instructions as to diet as will relieve him of the necessity of making an annual visit to the dentist whether such visit is advised as a precautionary measure or not. A physician treating, for example, a dyspeptic gives such instructions as will, if followed, lead to a complete cure of the complaint. He does not cure the patient merely *pro tem.*, and tell him to come back in six months or a year when his stomach is out of order again. A radical cure is wanted, and in such cases as those referred to can be had if only the patient is sensible enough to carry out dietetic treatment which ought to be given. Some day I have no doubt we shall have dietetic charts for our patients, with foods allowed and foods forbidden thereon.

May I ask if there is any clinical evidence known to anyone with regard to the effect of toast on teeth? It is rather lodgeable, but perhaps, on account of the hardness of the particles when crushed between the molars, the dense coating of bacteria, etc., associated with incipient caries may be dislodged.—*Dental Record, April, 1902.*

* * *

MR. DOOLEY ON POVERTY AND ITS ADVANTAGES.

By F. P. Dunne. Copyright, 1902, by Robert Howard Russell.

"Well, sir," said Mr. Dooley, "ye ought to be glad ye're not sick an' illusthrees at th' same time."

"How's that?" Mr. Hennessy demanded.

"Well, ye see," said Mr. Dooley, "suppose annything happens to ye now; a fellow counthryman dhrops a hammer on ye th' day afther th' picnic, or ye're digestion listens to a walkin' dillygate fr'm th' Union iv Mickrobes an' goes out on sthrike. Th' polisman on th' corner has th' usual suspicions among gentlemen an' hits ye over th' head an' calls th' wagon an' sinds ye home. Th' good woman wrings her hands an' calls Hivin to witness that if ye have a toothache ye wake th' neighborhood, an' slaps a mustard plaster on ye. If she comes back later an' finds ye haven't put th' sheet between ye an' th' plaster an' gone to sleep she knows 'tis seeryous an' sinds f'r th' doctor.

"We continyoo to have doctors in what th' pa-apers calls th' out-lyin' wards. They live above th' dhrug store an' practice medicine on us. Th' physicians an' surgeons are all downtown editin' th' pa-apers. Well, dock comes to ye afther a while in a buggy. On th' way up he sets a broken leg, removes an arm, does a little some-

thin' f'r th' city directhry, takes a dhrink, talks pollyticks with th' unhappy parent, an' fin'lly lands at ye'er dure with the burglar's tools. Afther he's closed that dure th' secrets iv th' inner man is known on'y to him. No wan hears or wants to hear annything about it.

'Th' nex' time we see ye, ye come out lookin' pale an' emacy-ated an' much younger an' betther lookin' thin annywan iver raymimbers seein' ye, an' afther awhile ye observe that whin ye start to tell how many stitches it took an' what ye see whin ye smelled th' dizzy sponge, ye'er frinds begin to sprint away. An' ye go back reluctantly to wurruk. Ye niver hear annywan say: 'Hinmissy is great comp'ny when he begins to talk about his sickness.' I've seen men turn fr'm a poor, helpless, enthusiastic invalid to listen to a man talkin' about th' Nicaragooan Canal.

"But with th' great 'tis far diff'rent. I've often thanked th' Lord that I didn't continyoo in polytics whin I was cap'n iv me precint, f'r with th' eyes iv all th' wurruled focussed, as Hogan says, on me, I cud niver injye th' pleasure iv a moment's sickness without people in far-off Boolgharya knowin' whether me liver was on straight.

"Sickness is wan iv th' privileges iv th' poor man that he shares with no wan. Whin it comes kindly to him th' four walls iv his room closes in on him like a tent, folks go by on th' other side iv th' sthreet, th' rollin' mill disappears, an' with th' mornin' comes no honest day's tile. He lies there in blessid idleness, an', no matther what's th' matther with him, he don't suffer half as much pain as he wud in pursoot iv two dollars a day. I knowed a man waunst who used to take his vacations that way. Whin others wint off f'r to hunt what Hogan calls th' finny monsther iv th' deep, he become seeryously ill an' took to bed. It made him very sthrong.

"But suppose I hadn't resigned fr'm Cap'n iv me precinct whin I was defeated. If annything had happened to me ye'd pick up th' pa-apers an' see: 'Seeryous news about th' Cap'n iv th' Twinty-sicond Precint iv th' Sixth Ward. He has brain fever. He has not. He got into a fight with a Swede an' had his ribs stove in. He fell out iv th' window iv a joolry store he was burglarizin' an' broke th' left junction iv th' sizjymoid cartilage. Th' trouble with th' Cap'n is he dhrinks too much. A man iv his age who has been a soak all his life always succumbs to anny throubble like hyperthroopily iv th' cranium. Docthor Muggers, dean iv th' Post

Gradyate Vethrinary School iv Osteopathy, says he had a similar case las' year in Mr. Hinnery Haitch Clohessy, wan iv th' best known citizens iv this city. Like th' Cap, Mr. Clohessy was a high liver, a heavy dhrinker, a gambler, an' a flirt. Th' cases are almost identical. Owin' to th' code iv pro-fissional eethics Dr. Muggers cud not tell th' bereaved fam'ly what ailed Misther Clohessy, but it was undoubtedly his Past Life.'

"Thin come th' doctors. Not wan doctor, Hinnissy, to give ye a whiff out iv a towel an' make ye sleep f'r an hour an' wake up an' say: 'I fooled ye. Whin do ye begin?' No, but all iv thim. They escort th' prisoner up th' sthreet in a chariot an' th' little newsboys runs alongside sellin' exthry papers: 'Our night edition will print th' inside facts about Cap Dooley's condition, an' th' Cap himsilf, with a cinomatograph iv th' jolly proceedin's be Dock Laparatanny.'

"What happens to the crim'nal at first is th' same as if he was a dacint wurrukin' man. But whin that is done, an' 'tis gettin' so aisy they tell me they'se not much diff'rence between a good clam-salesman an' a first-class surgeon, th' lithry wurruk begins. Ye think 'tis all over whin ye say: 'Dock, put ye'er hand under th' pillow an' take what's there. But not so. Th' assimbled docks adjourn to a large hall an' prepare th' story iv 'Cap Dooley; a Stormy Career.' Be wan who knows.

"'Upon seein' th' Cap, we at once diagnosed th' case as peritclipaliticikipantilitisitis, or chicken bone in the throat. Dr. Pincers operated, Dr. Smothers administered th' annysthetic, Dr. Hygeen opened the window, Dr. Anodyne turned on th' gas, Dr. Alicompane turned th' pitchers to th' wall, Dr. Rambo looked out th' window, Dochters Perioxid, Gycal, Cephalgern, Antipyreen an' Coletar took a walk in th' park an' Doctor Saliclate figured up th' bill.

"'As we have said, we diagnosed th' case as above. We can't raymimber th' name. It depinds on how th' syllables come out iv th' hat. We were wrong, although what we see whin we got in more thin made up f'r th' error. We made a long incision fr'm th' chin down an' another acrost, an' not findin' what we expicted, but many things that ought to be kept fr'm th' fam'ly, we put th' Cap back an' went on. Th' op'ration was a complete success. Th' wretch is restin' an' swearin' easily. We have given him a light meal iv pickles an' anti-septic oats, an' surgical science havin' done

its duty mus' lave th' rest to Nature, which was not in th' consultation, bein' considered be some iv us slightly irregular. (Signed)
Look at our names.

'Pincers,	Anodyne,	Antipyreen,
'Smothers,	Alicompane,	Coletar,
'Muffins,	Rambo,	Gycal,
'Hygeen,	Peroxid,	Saliclate.'

"But that' nawthin'. If ye think they'se annything ye wud like to keep up ye'er sleeve, look f'r it in th' pa-apers. 'Th' followin' facts is stated on th' authority iv wan iv th' attindin' surgeons: Cap Dooley cut up terribly undher th' chloryform, singin' songs, swearin' an' askin' f'r Lucy. His wife's name is Annamariar. She was in th' adjinin' room. It seems they have had throuble. Th' room was poorly furnished. Th' Cap's clothes was much worn, as was most iv him. He must have led a shockin' life. It is doubtful if he will iver raycover, f'r he is very, very old. He has been concealin' his age f'r manny years. He is a notorious profligate, as was well shown be th' view we had. Th' flash light pitcher iv th' Cap will appeal to all who knew his inner histhry.

"An' there ye ar-re. Think iv a man comin' out in th' light iv day afther all that. He can't get on clothes enough to cover him. He may bear himself with a haughty manner, but he feels that ivry man he meets knows more about him thin he knows himsilf. Th' fellow on th' sthreet has been within th' walls. He's sayin' to himsilf: 'Ye're a hollow sham, composed akelly iv impaired organs an' antiseptic gauze.' To th'end iv his life he'll niver be annything more thin an annytomical chart to his friends. His privacy is over f'r river, f'r what good can it do annywan, Hinnissy, to pull down th' blinds iv his bedroom if ivrybody knows exactly th' size, shape an' location iv his spleen?

"No, sir, if I've got to be sick, give me th' ordhn'ry dacencies iv poverty. I don't want anny man to know anny more about me thin he can larn fr'm th' handiwork iv Marks, th' tailor, an' Schmitt, th' shoemaker, an' fr'm th' deceitful expression iv me face. If I have a bad heart, let him know it be me eyes. On me vest is writen: 'Thus far an' no farther.' They'se manny a man on intimate terms with th' Impror iv Rooshya that don't know anny more about me thin that I'm broadcloth on Sunday an' serge on week days. An' I don't intind they shall. I hide behind th' privileges iv me

position an' say: 'Fellow citizens, docks an' journalists, I cannot inthrojooce ye to th' Inner Man. He's a reecloose an' averse to s'ciety. He's modest an' shy an' objects to callers. Ye can guess what kind iv man I am, but I wudden't have ye know.' An' I can do that as long as I stay poor."

"I'm glad I'm poor, said Mr. Hennessy.

"It gives ye less to talk about, but more to think about," said Mr. Dooley.—*Chicago American*.

* * *

TRICHLORACETIC ACID. By Dr. C. E. Drummond, Osage, Iowa. Read before the Iowa State Dental Society, May 21, 1901. Realizing that trichloracetic acid as a medicine was not a new remedy to many of the dental profession, it was with some hesitation that I decided to write upon this subject, but as I had been successful with its use I wanted to tell others something of its merits. Trichloracetic acid ($C_2HCl_3O_2$) is obtained by the action of chlorin on glacial acetic acid, or by the oxidation of anhydrous chloral by means of fuming nitric acid. This acid belongs to a group of three, all having similar properties. The other two are the monochloracetic and dichloracetic acids. All of the chloracetic acids are powerful caustics, destroying the epidermis. The mono and tri-acids are solid crystalline deliquescent bodies; dichloracetic is a colorless liquid having a suffocating odor. Trichloracetic acid occurs in colorless rhombic crystals, very soluble in water or alcohol.

My first experiment was in the mouth of a young man, who came to my office with the determination of having all of his teeth extracted. Upon examination I found some of them in a very bad condition; not only were they badly decayed, but the two central incisors were abscessed, and had been in that condition for about two years. The teeth were very loose, and the apical foramen had become so enlarged that an instrument could be run through without difficulty. I treated the two centrals with all the known remedies that I had at my command, without any apparent effect, and then, as I had read something concerning the value of trichloracetic acid, I resolved to try it. Owing to its antiseptic, caustic, stimulating, and astringent properties, I could readily see its value in such a case as the one in hand. I found from the first treatment with this acid beneficial results, so I continued for nearly a month. After that time the teeth had become firm and the gum tissue pre-

sented a healthy condition. I carefully filled the root-canals with chloro-percha and canal points and crowned the teeth. That was done one year ago the first of June, and the roots and gums seem to be in a perfectly healthy condition.

My next trial was in the mouth of a young lady suffering from pyorrhea, who had abandoned all hope of saving her teeth. They were all loose in the sockets, the gums highly inflamed, and the patient had not been able to properly masticate her food for some time, consequently she was much weakened for lack of proper nourishment. Previous to coming to my office the patient had had a number of her teeth extracted, so that in order to have proper masticating surfaces she would need either to have bridge-work inserted or have her teeth extracted and full upper and lower dentures inserted. We chose the former method. My success was more than I had dared to hope for. I first removed the deposits by the use of scalers and cleaned the teeth thoroughly, and then applied the acid, working it well down into the pockets and around the teeth. At the next visit a marked improvement could be seen in the condition of some of the teeth, while in others there had not been much change. On investigation I found some deposits remaining, which I removed and again applied treatment. This I followed up persistently until the gum tissue presented a perfectly healthful appearance, and the teeth had become so firm that I could attach bridgework, which was successfully done. The patient has ceased taking medicine, has regained her health and also put on flesh.

In another case of pyorrhea, which was an apparently hopeless one, in the mouth of a gentleman about fifty years of age, the patient said he had tried nearly everything known, except trichloracetic acid, without success. The disease in this case was of many years' standing. The same treatment was followed in this as in the preceding case, and there seems to be a complete cure. Also other cases of minor importance.

In treating a spongy condition of the gums the acid should be applied to the gum by means of an orange-wood point wrapped with cotton. Or where a cavity is filled up with hypertrophied gum tissue, the acid applied in the same manner will remove the tissue without pain to the patient and without bleeding. Trichloracetic acid has also been recommended for the removal of gum tissue from troublesome third molars. I have never tried it for that purpose,

but should think it would be valuable. I have successfully used it for canker sore mouth, which is at times very troublesome and painful. One or two applications will usually be sufficient. In these cases I use the pure acid in small quantities.

In cases of pyorrhea we often find bleeding gums troublesome when removing deposits from the teeth. A small piece of cotton saturated with the acid placed in the pockets of the gum for a moment will prevent bleeding, and we will be enabled to do our work much better. If a stimulating antiseptic effect only is desired, use 2 to 5 per cent; escharotic or solvent, 10 to 90 per cent. There are no systemic effects from the local use of trichloroacetic acid, but over 50 per cent should be used with care and the surrounding tissues protected. It can be used from 10 to 90 per cent in pyorrhea pockets, according to the results desired.—*Cosmos, May, 1902.*

* * *

VOLCANIC DISEASES OF TEETH. By U. S. Surgeon J. N. Eager. (*Public Health Reports.*) On the examination of certain Italian emigrants embarking at Naples one is struck with the frequency of a dental peculiarity known as "denti di Chiaie," described by Prof. Stefano Chiaie, and bearing his name. This impairment of the teeth, often not amounting to more than a mere imperfection, is an acquired one, due to local geological conditions, and so, because of altered hygienic surroundings, will not pass beyond the present generation of Italians in America. The etiology seems to be connected with volcanic fumes or the emanations of subterranean fires, either fouling the atmosphere or forming a solution in drinking water. In Naples it is more often attributable to water than to the air, and since the Serino water, brought in conduits from a distant mountain height, has been in use and local wells condemned, the incidence of the disease among infants has greatly diminished.

The people of Pozzuoli, a town of 16,000 inhabitants, situated five miles from Naples, are marked off from the people of neighboring places by their distinguishing characteristic of black teeth, apparently strong and serviceable, but devoid of enamel and hideously dark. The environs of Pozzuoli are everywhere volcanic. Close at hand is the Solfatara, a half-extinct crater full of cracks from which gases are constantly issuing. Some of the inhabitants of Pozzuoli drink the water of the springs, a water necessarily charged under pressure with volcanic fumes; all of them are con-

stantly living in an atmosphere filled with noisome gases. The theory most generally received in Italy is that these gases have a selectively hurtful effect on enamel formation in early childhood, but that the growth of the other dental tissues is not interfered with. When the cause is active during the entire period of second dentition, the whole tooth is bereft of enamel and becomes perfectly black.

Among the better class of Italians living inland it is the custom to go to the seashore in summer. Naples has always been a popular resort, and as a result of the temporary exposure of children brought with their parents to Naples (at the time when Serino water was not used) it is frequent to see among well-to-do people an otherwise handsome face marred by a line of fine, black markings crossing the incisor teeth in a horizontal direction. This fault of development is known among Neapolitans as "denti scritti" or writing on the teeth. The marking, when present on finely formed white teeth, resembles the diminutive lettering which is sometimes done on seashells for purposes of ornamentation.

FOREIGN BODIES IN THE EAR, TO REMOVE.—Dip the end of a camel's hair brush in glue and leave it in position against the body. When dry after a few hours, pulling upon the brush will remove the whole thing.—*Canadian Practitioner*.

HEALERS LOSE.—The Supreme Court has decided (*Jour. A. M. A.* March 1, 1902,) that magnetic healers and osteopaths must have a license to practice, in the case of the People against George P. Gordon, an advertising "healer" of Rockford. Gordon was charged with practicing medicine without a license, and after trial the Circuit Court directed the jury to find for the defendant. The Supreme Court reversed and remanded the cause. The following is the text of the finding of the court:

We all agree that the object of this [the statute] is to protect the sick and suffering and the community at large against the ignorant and unlearned who hold themselves possessed of peculiar skill in the treatment of disease, and to prevent them from holding themselves out to the world as physicians and surgeons without having acquired any knowledge whatever of the human system or of the disease and ailments to which it is subject. Without some knowledge of the location and offices of the various nerves, muscles, and joints the manipulation of those parts and the flexing of the limbs can not be intelligently, if, indeed, safely, practiced.

Merely giving massage treatment or bathing a patient is different from advertising one's business or calling to be that of a doctor or physician, and, as such, to administer osteopathic treatment. The one probably falls within the profession of a trained nurse, while the other does not.

Letters.

A SQUIB FROM MINNEAPOLIS.

MINNEAPOLIS, June 21, 1902.

To the Editor of the Digest,

MR. EDITOR:—Though a constant reader of the DIGEST for some years, I have never contributed a line to its pages. Recently, however, a sense of duty has possessed me, and in order to satisfy its demands I enclose a squib for your columns. Its size may suggest a cannon cracker rather than a squib, but I hasten to assure you that its contents, as you will probably perceive, are quite harmless.

Though fond of solid, scientific reading, I must say that I have always enjoyed the "facetious jocularities" that adorn your pages. I do not think that dentistry, with all due regard to proper dignity, should take itself too seriously.

Hoping that you will find my subject a timely topic, and right in the central current of events, I remain,

Yours very truly,

A. G. BENNETT.

[Dr. Bennett's philosophic, pertinent and pleasing poem will be found on page 563 of this issue. We take this opportunity of publicly thanking him for favoring us, and we hope he will not let his first attempt be his last. We also wish to assure our many friends and contributors of our appreciation of their help. May we be permitted to commend the example of Dr. Bennett and others to all our readers.]

AUTHORSHIP OF THE PAPAIN METHOD.

CHICAGO, July 12, 1902.

To the Editor of the Digest,

DEAR DOCTOR:—I was much surprised when reading Dr. Cassidy's article in the June DIGEST to note that he gives Dr. Harlan credit for being the first to use papain as a pulp digester. However, if my memory serves me correctly, the use of pepsin, hydrochloric acid, etc., has been repeatedly quoted in various dental journals as coming from Dr. Harlan. I have no desire to take the credit from him, but I wish to state what I believe is correct, as well as to avoid the constant rehash of old, tried methods as new treatment.

It is a matter for wonderment and speculation that the more modern text-books—Burchard, Kirk, Marshall, etc., do not even mention the pepsin method. I know that as long ago as when I was a pupil, in England, in 1883, my preceptor used the method, learning it from Prof. Oakley Coles. In my old mechanical dentistry (by O. Coles, 1873) the method was given, but I believe that it was not then so well thought of by the profession, because many forgot to add the hydrochloric acid, which is necessary for digestion to occur. Lactic acid came under the same teaching and for the same purpose, and Miller's theory of caries was not known.

I can hardly believe that Dr. Harlan was the first to use papain, as Dr. Jonathan Taft in his lectures to the students in the Dental Department of the University of Michigan, according to note-books of members of the classes in 1885-6-7, etc., gave credit to the finder, Dr. Wm. VanAntwerp, and spoke of its value as a digester and as being less irritating than pepsin. He also "suggested its being of value where pulps were only slightly affected by suppuration and necrosis, to digest the exposed portion, carefully cleansing with sterilized warm water, and capping, using any ordinary method, as collodion, phosphate of zinc," etc. He also spoke of its medicinal value in diphtheria, and the students asked where it could be obtained. From this it seems natural to infer that if the papain treatment were due to Dr. Harlan it would be found in some year previous to the International Dental Congress in 1900.

Speaking of pulp treatment, I have found the stearate of zinc with aristol and oleate of zinc and iodol as excellent agents for pulps which need stimulative treatment, then capping when an effort is being made to save the pulps, as in young teeth.

Yours truly,

VIDA A. LATHAM.

"AND LAST OF ALL THE WOMAN DIED ALSO."

SILVER CITY, N. M., July 14, 1902.

To the Editor of the Digest,

DEAR DOCTOR:—Reading the article on pp. 462-466 of the June number of the DIGEST—"Essential Oils; Their Application in Dentistry"—is well calculated to give a man "that tired feeling." One would think that these gentlemen were still hugging the delusion that drugs cure disease. They use up page after page of a supposedly valuable journal in discussing whether this drug or that

has the greatest germicidal power, and therefore is the best to use in the treatment of abscessed teeth. They labor learnedly to discover just how this or that drug produces a germicide, when the truth of the matter is that no germicide whatever is required in the treatment of abscessed teeth. If it were not for the patient and unrelenting toil and marvelous power of the tissues in getting rid of the germicides used these gentlemen would never cure an abscessed tooth.

They call on China, Ceylon, and the dirty chemical laboratories for germicides, when there is ever present, ready, and anxious to be used the finest, purest germicide that the world ever knew—the serum of the blood. It has been elaborated and perfected for this very purpose “since first the flight of years began.” It is the only germicide in the world that will allow the tissues to heal while in actual contact. If you secure the proper action of this substance you will cure the abscess, and if you do not you will never effect a cure.

The following remarks are made on the treatment of what are known as “blind abscesses,” those situated in the apical space, without fistulous opening. When a root canal is opened and there is a free flow of pus through it, followed by blood, the canal may be safely filled permanently so soon as the hemorrhage ceases. The apical space and canal will then be as thoroughly aseptic as if treated for a month. When the canal is small and the discharge is not free, or where there is a latent abscess, more time is required. The first thing to do in such cases is to use a stimulating dressing. This will cause an increased flow of blood to the parts, causing pressure which forces the poisonous gases, together with the drug used, through the canal, and brings an exudation of serum into the apical space. It is not necessary that the pus be forced through; for the giant cells will take care of the pus when the gases which are poisonous to them have been expelled.

The first dressing used in the treatment of such teeth should have the following properties: 1st, stimulating; 2d, penetrating; 3d, non-coagulating, so the canal may remain open for the escape of gases; 4th, liquid, for the same reason; 5th, insoluble in water, so that it will retain its properties; 6th, antiseptic, to keep the apical space from becoming reinfected from the oral fluids. I use oil of cinnamon for this purpose. When the abscess has been sufficiently

stimulated a dressing should be used having all the above-named properties except the first. Here I use campho-phenique. This on cotton in the root canal will hold its strength for months, and protect the apical space from reinfection even without other fillings.

It is better not to enlarge the canal at first sitting for fear of plugging it with drill cuttings. An open canal is the first essential to success, for with a plugged canal no drug will ever help a "blind abscess" per se. Yours truly, W. H. WHITE,

PHLEGMON AND FISTULA OF LOWER JAW.—Manley summarizes his article as follows: Perforative endostitis of the lower jaw is an infective lesion usually consecutive to caries of the crown, incomplete extraction, or the late eruption of the third molar. Infection first provokes an alveolar abscess, with widespread tumefaction and rigidity of the jaw. This may be followed by dislodgment of the imbedded fang or by alveolar necrosis. Perforative osteitis from a dead fang occurs through the least vascular surface of the mandible, by way of the dental canal; this is followed by an abscess, ultimately degenerating into a chronic, unsightly fistula. Surgical aid is resorted to, rather as a means of removing the blemish than because of severe pain. Operative intervention embraces the complete extraction of diseased fangs; dissection away of scar tissue; the thorough curettage of the sinus, and the closing of the breach in the soft parts in such a manner that little or no deformity will result after healing. Drainage must be entirely from the base of the alveolus into the mouth, hence the importance of frequent cleansing of the gums with antiseptic lotions until repair is complete.

TONGUE AND LIP CENTERS.—With the report of a case of cerebral bulbar palsy, Dana describes the localization of the tongue and lip centers, both in view of clinical experience as reported in the literature and from experiments observed. His conclusion is that in the human brain the lip and the tongue centers are closely connected and more or less identical. One group of centers for the tongue is in relation with the articulatory movements of the lips, and another with the movements of mastication, opening and shutting the mouth and deglutition. The area for the excitation of movements of the tongue is a wide one, being associated probably in its lower parts with the articulatory movements and in the upper parts with the masticatory movements. The centers lie at the base of the pre and post-central convolutions. Paralysis of the tongue, and to some extent of the lips, from a one-sided cortical lesion occurs, and may perhaps be explained by the fact that in many individuals the brain becomes accustomed to use only the center of one side, and that temporary paralysis will frequently follow an injury to the center in use. This will also explain the difficulties of deglutition and often of articulation in hemiplegia. Dana also doubts that permanent bulbar paralysis can be produced by cortical lesion of one hemisphere, if so, it must be considered an anomaly.

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Editorial.

THE TRAFFIC IN OFFICE RIGHTS.

A member of the Dental Protective Association calls our attention to the fact that an individual is traveling through the state of Illinois selling office rights and town rights entitling the buyer to use "A System of Painless Dentistry" On investigation we find that what he sells is valueless, as it is simply a modification of the "Hale Method of Painless Dentistry," which the Protective Association exposed several years ago. This is but one of numerous instances where worthless devices and methods are sold to gullible dentists. In almost all cases this loss and deception could be avoided if the members of the Protective Association would communicate with its chairman before purchasing. It can be stated as a general principle that when a man wants to sell office, city or state rights on a device, formula, method or anything of the kind, he is not giving value for money received, and could not succeed in the open market.

HOIST BY HIS OWN PETARD.

It will be remembered that at the meetings at Milwaukee last August Dr. James H. Worman, the American consul at Munich, was present and presented a great mass of evidence to show the discredit that was being brought upon dentists in Germany and upon the dental profession and dental colleges in America through the illegal and questionable transactions of the German-American Dental College of Chicago, aided by the Illinois State Board of Examiners. Students who were in nowise fitted to practice dentistry were graduated from this school, and when they began practice in their own country as graduates of an American dental college they of course cast discredit on American schools and dentists. The greatest abuse was in Germany, and it was shown that unless this traffic in diplomas was stopped the German government would

cease to recognize as reputable any American dental college or allow the holders of any diplomas issued in America to practice in Germany.

The National Dental Association appointed a committee to take up this matter, and appropriated \$1,000 to aid in carrying on the work. The National Association of Dental Faculties called a special meeting, and voted that each college should be assessed in a sum not to exceed \$50 to help on the reform. The editor of the DIGEST was appointed chairman of this committee, and at a subsequent meeting of this committee and the Committee on Foreign Relations of the N. A. D. F. the former was made the Prosecuting Committee of the Faculties' Association.

At this juncture the governor of the state of Illinois removed the state board of Dental Examiners and, with the exception of one member, appointed an entire new board. It was generally believed, but not proven, that certain members of the old board were guilty of malfeasance in office and were controlled by the German-American Dental College. Consequently, the committee began the accumulation of evidence to prove these facts, and in a short time the secretary of the old board, Dr. Jacob H. Smyser, and one Edward Flynn, a detective in the employ of the board, were indicted on several counts by the grand jury.

In this connection it should be remembered that all that made the diplomas from the German-American Dental College valuable was the fact that the Illinois State Board issued certificates to holders of same. We have evidence which will be presented later, showing the grossest collusion and abuse in these transactions. The new board was made of different stuff, and upon the advice of the attorney-general of the state adopted a new set of rules and regulations. Among them was one that the Board would refuse to recognize any dental college which did not come up to the requirements of the National Association of Dental Faculties, which were promulgated to govern the reputable schools of this country. The German-American Dental College did not meet these requirements, and the Board had grave doubts as to its reputability and trustworthiness; consequently, when a graduate of this institution presented a diploma and asked for a license the Board refused to grant it. Thereupon the dean of the College, Fritz W. Huxmann, brought mandamus proceedings to compel the Board to issue licenses upon

its diplomas, and the case was brought to trial July 9 before Judge Chetlain, one of the judges of the Superior Court of Cook County.

From the time of its organization the committee above referred to has been collecting evidence with a view of exposing the German-American Dental College and other diploma mills, so was well prepared to take charge of the defense of this suit. Huxmann undoubtedly expected an easy victory, but if he had known what evidence the committee had in hand he would not have brought the suit. His doing it saved the committee the trouble of bringing one against him. At time of going to press the trial is still in progress, and it will probably be some little time before it is ended and the court renders a decision. Of course in this case the court is simply to decide whether or not the Board acted in good faith in refusing to issue a license to a graduate of this college, but the suit is of vastly more importance than appears on its surface, because the proceedings are bringing to light sufficient evidence of corruption to probably wipe the German-American College out of existence and to lead to criminal proceedings of an unusual nature in the near future. Next month we can promise our readers a report of this suit in detail, which will astound them with its revelations of evil-doing.

Notices.

INDIANA STATE DENTAL ASSOCIATION.

The Indiana State Dental Association held its annual meeting at Lake Maxinkuckee, June 24-26, 1902, and elected the following officers: Pres., H. C. Kahlo; V.-P., J. H. Morrison; Sec'y, F. R. McClanahan.

NORTH CAROLINA STATE DENTAL SOCIETY.

The North Carolina State Dental Society met at Raleigh, June 17-19, 1902, and elected the following officers: Pres., J. M. Benton; 1st V.-P., J. R. Osborne; 2d V.-P., L. D. James; Sec'y, J. M. Fleming; Treas., R. M. Murrell; Essayist, F. L. Hunt.

COLORADO STATE DENTAL ASSOCIATION.

The sixteenth annual meeting of this Association was held at Colorado Springs, June 17-19, 1902, and the following officers were elected for the ensuing year: Pres., H. B. Hayden; V. P., E. W. Varley; Sec'y, W. A. Brierley; Treas., Wm. Smedley. The candidates elected for appointment by the governor on the state board of dental examiners were—W. H. Hall, H. F. Hoffman, M. H. Smith, T. Ashley, G. R. Warner. The next meeting will be held at Pueblo, June 16-18, 1903.

W. A. BRIERLEY, Sec'y.

PENNSYLVANIA STATE DENTAL SOCIETY.

The annual meeting of the Pennsylvania State Dental Society was held at Bedford, July 8-10, 1902, and the following officers were elected: Pres., R. H. Nones; V.-Ps., G. L. Jameson, I. N. Broomell; Rec. Sec'y, C. V. Kratzer; Cor. Sec'y, V. S. Jones; Treas., R. H. Swing.

RHODE ISLAND STATE DENTAL SOCIETY.

The annual meeting of the Rhode Island State Dental Society was held at Newport, July 8-9, 1902, and the following officers were elected: Pres., T. J. Lynch; V.-P., Dr. Whitmarsh; Sec'y, C. A. Carr; Treas., H. W. Gillett; Ex. Com., Drs. Powers, Wilbur and Stearns.

FIRST DISTRICT DENTAL SOCIETY OF ILLINOIS.

The First District Dental Society of Illinois will meet at Rock Island, Sept. 23-24, 1902. The outlook is encouraging, and this promises to be the best meeting in the history of the Society. Dentists in this and neighboring states are cordially invited to attend. L. W. SKIDMORE, Ex. Com.

MARYLAND STATE DENTAL ASSOCIATION.

The Maryland State Dental Association met at Baltimore, June 24, 1902, and elected the following officers: Pres., H. A. Wilson; V.-Ps., W. G. Foster, A. C. McCurdy; Rec. Sec'y, W. W. Dunbracco; Cor. Sec'y, F. F. Drew; Treas., S. G. Pennington; Board of Governors, C. J. Grieves, C. Gingrich, B. Holly Smith, G. R. Carter.

TENNESSEE STATE DENTAL ASSOCIATION.

The annual meeting of the Tennessee State Dental Association was held at Monteagle, July 8-10, 1902, and the following officers were elected: Pres., W. K. Slater; 1st V.-P., R. B. Bogle; 2d V.-P., W. P. Menzies; Rec. Sec'y, A. S. Page; Cor. Sec'y, J. T. Meadors; Treas., J. D. Towner; Ex. Com., J. H. Peete, W. P. Sims, A. R. Melendy. The next meeting will be held at Nashville.

News Summary.

H. K. JONES, a dentist at Parkersburg, W. Va., died June 15, 1902.

GEO. W. JONES, 74 years old, a dentist at Richmond, Va., died June 26, 1902.

WM. MOOREHEAD, 28 years old, a dentist at Denver, Col., died June 25, 1902.

A. L. SWEET, 22 years old, a dentist at Bennington, Vt., died July 4, 1902.

IVORY WEBSTER, dentist, aged 82 years, died at West Liberty, Ia., July 3.

C. E. ALTEMUS, a dentist at Johnstown, Pa., is critically ill with typhoid fever.

E. C. SMITH, 58 years old, a retired dentist at Westfield, Mass., died July 2, 1902.

TORIAS SCHLOSSER, 88 years old, a dentist at Hagerstown, Md., died June 29, 1902.

C. B. RIGGS, 44 years old, a dentist at Lincoln, Neb., died June 17, 1902, from heart failure.

R. E. MOON, 56 years old, a dentist at Cleveland, O., died July 6, 1902, after six months' illness.

F. L. DANFORTH, a dentist at Malone, N. Y., 50 years old, died June 20, 1902, from blood poisoning.

F. S. WEBSTER, of Carthage, Mo., who went to Kansas some time ago for his health, is reported as convalescent.

J. B. DUNLEVY, 84 years old, and until three years ago a dealer in dental supplies at Pittsburg, died June 29, 1902.

I. J. WEATHERBEE, 85 years old, and one of Boston's oldest dentists, died at Dorchester, Mass., June 24, 1902, after a short illness.

E. E. BUCKLE, 35 years old, a dentist at Dexter, Mo., died June 26, 1902, from pleural abscess, caused by a blow in a boxing match.

LOUIS ZORN, a retired dentist at Kansas City, Mo., killed one of his tenants June 22, 1902, in a quarrel over the payment of rent.

SPRINGFIELD (O.) DENTAL SOCIETY at its annual meeting, June 23, 1902, elected the following officers: Pres., H. J. Bosart; Sec'y-Treas., W. A. Barber.

FASHIONABLE.—"Have you a fashionable practice?" asked the caller. "Oh, yes, you should see the howling swells leaving my office," replied the dentist.

STRENGTH IN NUMBERS.—It is suggested that an editor uses the term "we" so that if people don't like what he writes they will think there are too many people to be tackled.

MONTANA STATE BOARD OF DENTAL EXAMINERS elected the following officers June 26, 1902: Pres., E. A. Myers; V.-P., G. W. Pelzer; Sec'y, D. J. Waite; Treas., H. J. Wirth.

BANKRUPT.—**M. W. Pray**, a dentist at Holbrook, Mass.; liabilities, \$2,208; assets, none. **F. P. & L. W. Wilkins**, dental supplies, Boston; liabilities, \$2,681.23; assets, \$475. **F. B. Yeilding** Laceyville, Pa.

SIMILIA SIMILIBUS CURANTUR.—On being asked, the old gentlemen stated that Christian Science did not cure him of rheumatism, but that rheumatism cured him of Christian Science, which seemed plausible.

RUSSIA VALUES TEETH.—A Russian opera singer had five teeth knocked out in a railroad accident recently, and the civil court in St. Petersburg has given judgment for \$50,000 in her favor against the railroad company.

MORE APPRECIATION.—"The **DIGEST** gets better with each succeeding year." **O. M. Daymude**, Monmouth, Ill. "I think the **DIGEST** is rapidly coming to the front." **J. E. Stevenson**, Ponca, Neb. "I think the **DIGEST** the best and most useful, with real practical suggestions, of any of the journals. I take several." **J. B. Devlin**, Chicago.

WAR BECOMING HEALTHFUL.—"I can see in me moind," says Mr. Dooley, "th' day when explosives'll be so explosive an' guns'll shoot so far, that only th' folks that stay home'll be kilt, an' life insurance agents'll be advisin' people to go into th' army."

CHARCOAL AS A DENTIFRICE.—The *Review Dispatch* of Moline, Ill., says, "To whiten the teeth, clean them twice a day with pulverized willow charcoal." Some of the profession in that town should enlighten the editor, or there will be some sorry looking gums among the ladies.

CHURCH FAIR SELLS TEETH.—At a Baptist church fair in Lee, Mass., several sets of false teeth were offered for sale, and finally a toothless man became the owner of one on payment of twenty-five cents. They did not fit, of course, but he thought "they would work all right after a while."

HARVARD DENTAL ALUMNI ASSOCIATION held its thirty-first annual meeting at Boston, June 23, 1902, and elected the following officers: Pres., L. D. Shepard; V.-P., C. E. Perkins; Sec'y, Waldo E. Boardman; Treas., E. P. Holmes; Ex. Com., Waldo E. Boardman, Wm. P. Cooke, N. A. Stanley.

ACCIDENTS.—H. S. Abendschein, a dentist at Baltimore, Md., was severely burned last month by the explosion of a gasoline heater in his laboratory.—A young woman assistant in the office of a St. Paul dentist was badly injured last month by the explosion of a vulcanizer, which also wrecked the room.

INSECT REPELLANTS.—It is claimed that the odor of the oils of citronella or of pennyroyal will drive away mosquitoes, and that oil of mint repels and oil of thyme attracts insects. Mignonet or geraniums in blossom will keep out flies, as also will a few drops of oil of bay leaves placed near a window.

CENSUS WORK DONE RAPIDLY.—The final report of the statistics of manufactures for the twelfth census is in print, which is an unprecedented event in census history. The difficult and complicated task has been accomplished without delay or friction, and the information will be of immense value to the public.

WISCONSIN STATE BOARD OF DENTAL EXAMINERS held its annual meeting at Madison, May 13-16, 1902, and elected the following officers: Pres., C. C. Chittenden; Sec'y, J. J. Wright, 1218 Wells Bldg., Milwaukee. The present personnel of the board is—J. J. Wright, L. L. Leslie, E. A. Gatterdam, C. S. McIndoe, C. C. Chittenden.

DOWIE AS A DENTIST.—A deaconess in Dowie's church stated recently in public meeting that prayer according to Dowie's methods had cured her of consumption and brought her a new set of natural teeth. We knew that Dowie had been trying to run physicians out of practice, but did not suppose he was going to interfere with dentists.

SMALL CHARGE FOR MISTAKES.—Prices in the Klondike are very high for everything. A man recently returned from there related that a dentist charged him only \$2 for extracting a tooth, explaining that the price was low because he pulled the wrong one, but that if the patient wanted the aching one taken out it would cost him \$10.

DENTAL COLLEGE COMMENCEMENTS.—Tufts College, Dental Department, Boston, Mass., June 18, 33 graduates. University of Michigan, Dental Department, Ann Arbor, Mich., June 19, 69 graduates. College of Physicians and Surgeons, Dental Department, San Francisco, June 25, 46 graduates. New York Dental School, New York City, May 5, 1902.

BOSTON AND TUFTS COLLEGE DENTAL ALUMNI ASSOCIATION held its annual meeting last month and elected the following officers: Pres., H. R. Piper; 1st V.-P., J. W. Forbes; 2d V.-P., W. E. Brigham; Rec. Sec'y, M. L. Woodward; Cor. Sec'y, G. E. Squires; Treas., Wm. Rice; Ed., J. R. Piper; Ex. Com., F. S. Fogg, I. J. Weatherbee, W. F. Winchester, B. H. Strout.

"THE BOY GUESSED RIGHT."—A small boy with the toothache recently went to a dentist, accompanied by his uncle. It was decided to administer ether, so this was done and the tooth removed. As the little chap began to regain consciousness he asked, "Am I in heaven?" but as his vision grew clearer he saw his uncle and said, "No, I am not in heaven, for there is Uncle Bob."

THANK YOU, DR. HOFF.—"The proceedings of the National and Southern Dental Association, through the enterprise of the DENTAL DIGEST, have come to hand just six months after the meeting. This is several months earlier than for any previous meeting. The printing and bookmaking are exceptionally well done, and reflect great credit on the publishers."—*Dental Register*.

DAMAGE SUITS.—A woman of Columbus, O., on June 23 brought suit against a dentist for \$2,000 damages, alleging that he treated her teeth unskillfully and burned one side of her face with arsenic.—A man at Youngstown, O., recently died of gangrene of the gums, and his widow has sued a dentist in the town for \$2,000 damages, alleging that death resulted from improper dental work.

PENNSYLVANIA UNIVERSITY DENTAL COLLEGE ALUMNI ASSOCIATION held its twenty-second annual meeting at Philadelphia June 17, 1902, and elected the following officers: Pres., W. D. Tracy; V.-Ps., R. H. D. Swing, C. D. Crooks, J. P. Nichol; Sec'y and Treas., Victor Cochran; Orator, G. W. Hurd; Coeditor, W. Zerfing; Ex. Com., R. H. D. Swing, H. B. Hickman, F. W. Allen, S. P. Cameron, M. I. Schamberg.

FIRES.—S. J. Cunningham, San Francisco, June 14 lost his office and dwelling. Dr. Meadow, a dentist at Donalsonville, Ga., June 26 lost \$250; no insurance. G. E. Medley, Hopkinsville, Ky., June 24 lost \$1,000; no insurance. A. Matthews, Omaha, June 28, \$200. It is believed that rats and matches caused this blaze. E. M. O'Huse, Alexander City, Ala., June 12, \$500; partly insured. J. S. Roberts, Hartshorne, I. T., June 14, \$600; insurance, \$400.

ROBBERIES.—Two dentists at Aurora, Ill., were robbed on July 8, and two at Elgin, Ill., on July 7 lost respectively \$10 and \$25.—June 24 a dentist at Gloucester, Mass., lost \$100.—June 28 a dentist at Beaver Falls, Pa., lost \$115 in gold and supplies.—June 19 the office of a dentist at San Antonio, Tex.,

was looted of \$10.—It is reported that nearly a dozen dentists in Toronto, Can., have recently been robbed by sneak thieves or burglars. In all cases gold only was taken.

POPULATION OF THE UNITED STATES.—The total population of the United States on June 1, 1900, was 76,803,887. Of native-born persons there were 65,848,802, and of foreign-born 10,460,088—that is, of every 1,000 persons, in 1900, 868 were born in the United States, and only 137 outside the borders of the country. If in the foreign element are included the children of foreign white parents, the foreign element now constitutes about one-third of the total population—34 per cent. The native whites of native parentage constitute slightly more than one-half—53.8 per cent.

SEASONABLE SIGNS.—"I'm in court," reads a card on the lawyer's door; "At the hospital," appears on the doctor's slate; "Be back in an hour," say several more, while others invite one to "Sit down and wait." "Gone to the bank," is the broker's sign; "Back soon," is found on the ice dealer's hook; "Out collecting," says a dealer in wine; "Sick in bed," is the dentist's—so says his book. 'Twas everywhere thus, so with nothing to do, I hied me away to the baseball ground; and there, strange to say, yet none the less true, each of the above in the grand stand I found.

FATALITIES.—A man at Philadelphia is just recovering from an attack of blood poisoning, which threatened to be serious. The broken end of a wooden toothpick, which lodged between his teeth and entered the gum, is responsible for the trouble.—A man at Leavenworth, Kas., this month swallowed a lower full set of artificial teeth and is not expected to live.—A man at New Haven, Conn., died this month from blood poisoning. He had an inflammation of the face and jaw, and a dentist extracted an ulcerated tooth. The trouble grew worse, however, and when the man died his relatives threatened the dentist with a damage suit. It was proven, however, at the inquest that he was not responsible for the death.

MARRIED.—John D. Biggs-Lucy S. Gunn, June 18, Williamston, N. C. J. B. Brashear-Lucy Colson, June 30, Middlesboro, Ky. L. D. Carpenter-Laura Rehkopf, June 25, Indianola, Ia. Frank Corry, June 25, Terre Haute, Ind. P. N. Crittenden-Florence Sawyer, June 12, Addison, Mich. C. W. Dorsey-Lula Wood, July 2, Dayton, O. L. B. Gray-Hortense Bowman, June 25, Stewart, Ia. M. D. Hamisfar-Grace E. Davis, June 21, Warrensburg, Mo. Arthur Lingo-Louise Richoff, July 1, Muscatine, Ia. R. D. Marsh-Adda Burkett, June 18, Dayton, O. R. P. Neil-Della E. Harris, June 26, Calumet, Mich. A. A. Powell-Eva C. Thornbury, June 11, Mattoon, Ill. G. L. Stebins-Edith B. Montgomery, June 17, Aurora, Ill. C. B. Thompson-Mabelle Jones, June 12, West Pullman, Ill. A. J. Weiss-Jennie B. Henderson, June 18, Minneapolis, Minn. D. B. Wright-Anna P. Detwiler, July 2, Harrisburg, Pa.

BROKEN APPOINTMENTS NOT PAID FOR.—A dentist in San Francisco sued a young man to collect a bill for \$80, which included charges for time lost when the patient failed to keep his appointments. The defendant claimed that he was a minor at the time and could be sued only for necessary things.

The judge gave the judgment for \$85 to cover the work actually performed, holding that a minor could not be held liable for broken appointments. We think if the dentist had sued the boy's father or guardian the whole bill could have been collected, as this precedent has been established in many states. Your editor collected a good sized bill against an estate some three years ago, which included several charges for broken appointments. The judge in this court usually cut down claims, but he allowed these charges without question. The sooner dentists impress upon community the fact that their time is valuable the better it would be for the profession.

KEEPING COOL, WITH SPECIAL REFERENCE TO THE PROPER USE OF WATER.—Ralph Wait Parsons says that by introducing water in small and frequent quantities either into the stomach or rectum, we can obtain a reduction in the bodily temperature, due to the direct effects of the cooling properties of the water, to reflex action, and to stimulation of the function of the sweat glands. In hot weather, he advocates a dip in water at 60 deg. to 70 deg. F., lasting from one-half to one minute, and followed by a vigorous rub with a coarse bath towel. A shower bath is even better. This cold bath stimulates the heart and nervous system, gives a sense of well-being, gives a healthy glow to the skin, improves the appetite, and rejuvenates the whole organism, giving energy to resist the depressing effects of heat and sultriness. At the close of a hot day, a bath at 103 deg. to 105 deg. F., lasting from three to seven minutes, is cleansing and stimulating, it should be followed by cold water, and after a brisk rub the bather can go to rest, and in the majority of cases enjoy a good night's sleep, although the temperature be very high.—*Med. News.*

ILLEGAL PRACTITIONERS.—A dentist at San Bernardino, Cal., was arrested on June 17 for practising dentistry without a license. He admitted that he was not a graduate and had never been in attendance at a college. The jury, however, failed to agree, so he was discharged. June 18 the employe of a dental parlor at Louisville was arrested for practising without a license, but in this case also the jury failed to agree. His employer engaged in a rough and tumble fight with the officer who made the arrest and was fined and sent to jail. A dentist at Baltimore was arrested and pleaded guilty to practising without a license, but as he was competent he was released on condition that he would take the examination and obtain a certificate. A dentist at Liberty, Mo., was arrested June 24 for practising without a license and was fined \$100. We reported last month that a dentist at Kenosha, Wis., was arrested for illegal practice. At the trial he showed a certificate, and now threatens to bring suit for false imprisonment. Another dentist in Kenosha will probably be arrested for practising without a license.

EXAMINING BOARD AFFAIRS.—The California State Board of Dental Examiners met at San Francisco in June, and passed 121 out of 125 applicants. The board passed a resolution to the effect that it would not recognize the San Francisco Dental College as a reputable institution. The college has brought a mandamus suit against the board and the matter is now being argued in court.—The Dental Commissioners of Connecticut met May 28 80,

and passed 8 out of 25 candidates. The next examination will be held Nov. 11-13.—The Louisiana State Board of Dental Examiners met at New Orleans May 7 and passed 15 out of 20 applicants. The next examination will be held the second Tuesday in October.—The Minnesota State Board of Dental Examiners met at Minneapolis last month, and passed 45 applicants.—Dr. S. C. Rubey, of Clinton, on June 19, was appointed by the governor a member of the Missouri State Board of Dental Examiners, to succeed Dr. W. W. Birkhead. Dr. Rubey was unanimously endorsed for the appointment by the State Association. Dr. J. R. Megraw of Fayette, was also appointed a member of the Board.—The Montana State Board of Dental Examiners last month examined and passed 15 applicants.—The North Carolina State Board of Dental Examiners met this month and passed 24 out of 26 applicants.—The New York State Board of Regents met at Albany July 2, and the question of the substitution of the degree of D.D.S. for that of M.D.S. was referred to the college committee for a written report at the next meeting of the Regents.

A STAY OF PROCEEDINGS.—A lady physician in Denver recently entered proceedings against the surgeon who set her broken leg, because one limb was shorter than the other. A feature of the court proceedings is described by a local "poet," in the following lines:

"Order in the court! Of proceedings grant a stay,
A picture must be taken and taken right away."
The lady flushed a rosy red, the jury all turned quick,
And the kodak man he kodaked 'ere any one could think.

The case it was a lengthy one, and waxed an awful lore;
The lady took her shoe off and stood upon the floor,
To show the jury plainly so that every one could see
That one leg was much shorter than it really ought to be.

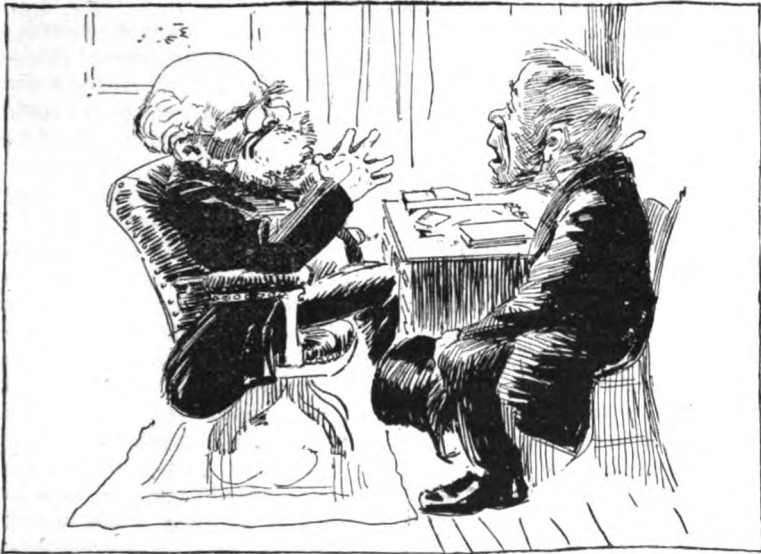
The lady had been X-rayed a time or two before.
The doctors said it wouldn't do, they must be showed some more,
And then she shed her stockings, and fainted dead away
When the fiend pressed the button on his kodak yesterday.

The doctors all enjoyed it; the judge and jury smiled,
The lady may be pardoned if her looks were fierce and wild;
And doctors, judge and jury hummed an ancient memory—
"One of his legs was longer than it really ought to be."

—*Med. Standard.*

POINTING OUT PHYSICAL SIGNS OF INJURIES.—The second appellate division of the Supreme court of New York holds that there was no error, in the personal injury case of *Perry vs. the Metropolitan Street Railway Company*, in permitting a physician to exhibit the bared body of the party suing to the jury, and to point out thereon physical signs of the injuries alleged to have been sustained. The reason it gives is that such physical exhibition was necessary to a demonstration of the deformity testified to by the physician,

and tended to make the description of the injury more intelligible to the jury. It says further that there is a manifest distinction between an exhibition of a deformed body by way of a more intelligent and satisfactory understanding of the injury (and its effects where the extent and character of the injury are challenged), and the exhibition of a dead and severed part of the body, where the injury is unchallenged, and when the purpose of the show is to prove a matter of minor importance fully capable of proof by evidence which has no tendency to influence or prejudice the jury.—*Jour. A. M. A.*



DOMESTICATION DIFFICULT.—Dr. Stickem, "What seems to be the matter with you?" Brannigan, "Sure there's somethin' the matter wid me jaw, for faith, I can't domesticate me food."

TOBACCO AND ALCOHOL.—The ill effects of tobacco are not fully experienced, even when smoking is indulged in to excess, unless much alcohol is consumed by the smoker at the same time. That is a well-known fact, but the cause of the peculiarly disagreeable effects sometimes produced by the combination of tobacco and alcohol has never been clearly understood. In a note on the subject in the *Lancet* it is suggested that though, even after a more moderate indulgence in tobacco, no toxic symptoms such as headache and stupor may supervene, yet such would probably be the case if alcoholic drinking were practised at the same time. The powerfully solvent action of alcohol is said to be sufficient explanation of that, since nicotin and pyridin are very easily soluble in alcohol. It is pointed out that the chief poisonous constituent of tobacco smoke is pyridin and not nicotin. The former is a poisonous base not so easily soluble in water as in alcohol, and it is stated

that it can be easily traced in the mouth of an immoderate smoker, especially of the smoker of cigars. "An alcoholic drink is therefore calculated quickly to wash out this poisonous oil and to carry it into the stomach, absorption of the poison ensuing, giving rise to definite toxic symptoms, due not so much to alcohol or pyridin bases alone as to the combined action of both in the manner indicated. Such symptoms would probably be avoided if smokers would abstain from drinking alcohol at the same time that smoking is indulged in. Many a headache or malaise would thus be guarded against."

ETHER ANESTHESIA.—Hess attributes vomiting in ether anesthesia to the excretion of ether by the mucous membrane of the stomach, where it acts as a gastric irritant, subsequently causing gastritis. He gives the results of some experiments on animals demonstrating this fact. To prevent the irritant effect of ether on the stomach requires simply the dilution of the ether as it is excreted. A glass of water drunk at the commencement of anesthesia serves to hold in solution considerable ether. Limiting the amount of ether used and the strength of the vapor is always an important factor. This will help to prevent excess of secretion of mucus in the larynx and bronchi, which, when swallowed, adds to the gastric irritability. —*Med. Rec.*

HEADACHES OF NASAL ORIGIN.—A Bronner believes that headaches are often due to diseases of the nose and its accessory sinuses. Nasal headache is often of a neuralgic character and is then generally caused by sinus disease. It is generally supraorbital or localized in the middle of the head behind the eyes or at the top of the head. It is usually intermittent, often very severe, and it comes on at certain fixed periods, but is always worse in the morning. A diffuse headache may be due to nasal obstruction or rhinitis. The head symptoms due to sinus disease are not characteristic or confined to any special area. Antrum trouble may cause pain in the cheek or frontal region. Frontal sinus disease causes local pain increased on pressure. It radiates into the head and is often worse over the sinus of the opposite side. The pain is intermittent and worse in the morning. It is increased by any sudden movement. The pain from ethmoidal disease is not typical or severe. It is chiefly confined to the nose and radiates backward. Affections of the anterior ethmoidal cells simulate frontal sinus disease; those of the middle or posterior ethmoidal cells simulate sphenoidal trouble. The latter is generally not diagnosed. There is usually intense pain in the middle of the head behind the eyes. It is intermittent and may be absent for days or weeks. There are frequent attacks of giddiness and the head feels as if it were going to burst. —*Lancet.*

TO MAKE GOLD COHERE UNDER ALL CONDITIONS.—When it is advisable to repair an old gold filling without removing the gold already in position, it may be accomplished by following the directions here outlined. (1) Apply the rubber-dam. (2) Clean the tooth carefully with lukewarm water. (3) Wash it with sulfuric ether, to dissolve any fatty or oily substance. (4) Go over the filling with alcohol. (5) Dry with warm air. (6) Carefully anneal a pellet of No. 4 gold. (7) With a very fine pointed plugger go over the entire surface of the gold, put on, first with hand pressure, then mallet it

well. (8) After that go over it with a convex plugger. (9) The direction of the force should be at right angles to the surface worked upon. (10) If you have followed these directions in applying two layers, you can go ahead in the usual manner and use either pellets or leaf gold. Having tested it in various positions, I find it entirely satisfactory except where the filling is subject to great stress, when it is ill-advised.—X. Dodel in *Ohio Dent. Jour.*

NERVOCIDINE: A NEW LOCAL ANESTHETIC.—Nervocidine is the active principle of an Indian plant called gasu-basu. It is a yellow, amorphous, hygroscopic powder, easily soluble in water, less soluble in ether and alcohol. Its aqueous solution froths when shaken and gives all the reaction of an alkaloid. It has been tried as a local anesthetic and has been found to possess very strong anesthetic properties. Its action is very prolonged; for instance, the effect of a one-half or even one-fifth per cent solution may last for two or three days. It has, however, some drawbacks, such as the local irritation to which it gives rise, the slow production of the anesthetic state (from ten to twenty minutes being required), and strong toxic by-effects: nausea, salivation, vomiting, etc. So far its use has been restricted to dentistry, especially as a substitute for arsenious acid in the treatment of painful pulpitis.—*Lancet*.

GRAY HAIR AND EMOTIONAL STATES.—Jones reports a well-authenticated instance of a patient, a man, 58 years of age, whose hair and beard, during a period of five weeks, changed from a flecking of gray to an absolutely pure white. The author has investigated the color of hair of 2,398 insane persons—1,400 females and 998 males—in the Claybury asylum, and also attempted a comparison of the color of hair with temperament and disposition of the patients. He found the hair in the maximum number of men dark-brown, and not brown as in Galton's table, whereas the women corresponded with the table, and a higher percentage of women than of men had light-brown and red hair, as also gray and very gray hair (not in Galton's table), but there was a greatly preponderating number of bald-headed and very bald-headed persons among the men. This seems to indicate a more marked loss of self-control among fair females than among males, but a greater proportion of baldness (as among the sane) in men than in women. He took a further record of the color of the hair among those who attended the entertainments and dances, and compared this record with that obtained among those who attended Divine service. A preponderance of very fair and brown-haired women attended the dances rather than church or chapel services, these latter being of the darker, more sober, or atrabilious temperament, and this was also true of the men. In both sexes it was noticed that gray-haired persons attended services in preference to entertainments—the passive attitude of religious ministrations being more appreciated by the old, whereas active indulgence in pleasurable pursuits prevailed among the young. The author finally discusses the influence of nervous changes upon the hair and is inclined to the view that there is a close physiological connection between the cerebrospinal axis and the skin. Probably the nervous system has a dominating control over the pigmentary system.

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Original Contributions.

AN ORIGINAL SYSTEM OF TIGHTENING LOOSE LOWER INCISORS AND CUSPIDS, EMBRACING A METHOD OF SECURING SUBSTITUTES WITHOUT CLASPS OR PLATES, WHEN THESE TEETH ARE MISSING; TOGETHER WITH A DISCUSSION OF THE QUESTION OF PULP DEVITALIZATION— WHEN AND HOW—IN SOUND TEETH.

BY D. D. SMITH, M. D., D. D. S., PHILADELPHIA. READ BEFORE THE
NEW YORK ODONTOLOGICAL SOCIETY, FEB. 18, 1902; ALSO
BEFORE THE CINCINNATI ODONTOLOGICAL SOCIETY,
MARCH 19, 1902.

(Continued from the July DIGEST, p. 547.)

I have made the assertion that we should remove dentin freely from the internal portion of the tooth, for the purpose of placing the root in the best possible condition for future service. I should like to show, from the rough drawing I am now making (illustrating on blackboard), why this is so. The utility of a tooth is greatly dependent upon its cemental and pericemental relations; a firm vital connection between root and alveolus is of far greater importance than the condition of that portion of the tooth we call the crown. It may sound strange for me to say that when the pulp of a tooth has been devitalized, it does not matter very much, with our present methods, what becomes of the crown. Nevertheless, it is true, for we can replace it with something quite strong enough, just as useful, and as artistic as the original, and the root, which with the death of the pulp is all devitalized, except the cementum and the pericementum, will never know whether it is carrying what nature placed there for the crown, or what we

may substitute. There can be no question about this, so we should aim to place the root in the best possible relationship with the alveolus, for it is upon this that the utility and permanency of the tooth depends. The only living osseous part of a tooth with a devitalized pulp is the cemental structure which forms the external portion of the root. Around that is thrown what is found around every bone in the system—a pericemental membrane, which, nourishing the cemental structures, makes the root a living organ within the alveolus. All this indicated by these lines (illustrating) is really dead matter; all this dentin, inseparably united to this living cementum which surrounds it, is not only without vitality, but is permeated with decomposable matter. Now, what does common sense say we must do if we would place this cementum in harmonious relationship with this devitalized dentin and with the membranes which nourish it? It says, "Disinfect these tubules and the intermediary substance between them, so that the cemental structure shall retain living contact with the dentin, just as though the dentin itself were alive," and this can be done.

There is often with death of the pulp seemingly a special effort on the part of the pericementum to increase the cemental structure for the benefit of the root in the alveolus. This is seen in new deposits of cementum upon itself. Deposits on the outside of the root are especially noticeable in connection with devitalized teeth in young subjects. Young teeth when devitalized are frequently subject to exostosis. We find this in molars and in bicuspid, especially, and in these cases it is to be reckoned a fortuitous condition, for this accretion, being analogous to the cementum, serves to augment and reinforce the living part of the root. The thicker the cementum is, within certain bounds, the better the root will be retained in the alveolus.

Now, is it not perfectly apparent that if we would place this living cementum and the devitalized dentin in the most harmonious relationship, we must remove from the dentin that which is obnoxious to the living matter that remains? What is the harmful matter in devitalized dentin, and what does it come from? I once heard an eminent practitioner from Chicago say, speaking upon the subject of pulp-putrescence, that "the odors came down into the tooth." Shall we talk of odors coming up or down into a tooth? If so, where do they come from? Where can they come from, except it be from the circulating media around the

tooth? Do the vessels which surround the tooth, vessels which carry nutrient matter to it, also bring foul odors and deposit them in this devitalized tooth? No. Do they come into the tooth from any outside source? By no means. There is nothing at all approaching such process in connection with pulpless teeth. From whence then do our troublesome odors arise? Manifestly in the once living matter which is now the subject of decomposition in the tubules and the intermediary substance; in decayed matter under fillings, and in bacterial generations which may in any manner be confined in a tooth. These conditions—decomposition within the dentin itself—become obnoxious to the living cementum of the root, and as a result we have periosteal disturbance, inflammation and alveolar abscess.

How then shall we interpose for the prevention of these untoward conditions? Not, surely, by introducing a filling into the root canal to prevent odors from coming down or up. We will rather first of all remove liberally from the internal portion of the root the substance which through decomposition engenders bacterial formations and odors.

Are we injuring the tooth—a devitalized tooth, in doing that? If for crowning we were dependent upon the old wooden pivots, or upon a pin or post in the center of the root, as in case of the Logan crowns, then possibly we should be constrained to save all this tooth substance for strength; but fortunately we are not dependent upon a central support alone and we may remove as much of the dentin as we deem best. One thing we may not do, and this prohibition is absolute; we may not encroach upon any portion of the cementum or of the pericemental membrane. When Dr. Atkinson was living I understood him to say we should go through the root until we drew blood. With all deference to the teachings of that brilliant man, who did so much for the advancement of dentistry throughout the world, such procedure is a mistake. We should not encroach upon this cemental structure at any point. When we do we are doing violence and injury to the tooth. But we may take away from this dentinal substance, which forms the body of the tooth-root, and which with the death of the pulp becomes dead matter, and thus do a positive service to the living cementum on the root. By removing dentin which is the source of infection, we place the root and tooth in a better condition for future preservation and usefulness.

It remains now only to speak of the medicaments and treatment, after having removed as much as we can of the infectious matter from the internal substance of the tooth. There are certain roots, especially the mesial, of the lower molars, and the roots of the first upper bicuspid (which we frequently find bifurcated), where great care is required to follow the canal and avoid injury to the cemental structure. There are others, as the palatine root of the upper molars, the root of the second bicuspid, of the central, of the cuspid, and frequently of the lateral, where we can remove dentin freely. Having done that, what other means can we employ to further safeguard the remaining dentin in these pulpless roots?

If it were proper to speak of a specific in dentistry, and I were asked to name the one remedy which might be used with safety and certainty in all teeth and roots for the purpose of permanent disinfection, I would unhesitatingly recommend pure wood creosote. I am aware that the newer practice of dentistry runs in other directions, and multiplies remedies to the bewilderment of the dentist and the injury of patient. Thirty-five years of experience have abundantly shown that creosote is the one remedy tolerated and beneficial in all cases. It does its work as a disinfectant and a corrective, and induces harmonious relationship between the devitalized dentin and the living cementum better than any agent we know. It is a perfect root disinfectant, destroys bacteria, and can be used without injury to any tooth. It is not specially pleasant to the taste, but all things considered, it is the least objectionable of the effective medicaments for root dressing. The objections to it are as nothing compared with the great benefits resulting from its use.

And now one other word in regard to root filling. There has been a great deal of discussion these last few years about "immediate root filling." Just now the talk is chiefly "porcelain inlay" and "extension for prevention," but root filling and immediate root filling have occupied so much time and space that one might almost conclude that the filling of roots is the main operation in dentistry. Of course, the root can be filled immediately after removing a pulp, but are we to understand—and I have never seen any distinction made in the journals or in discussion as to *when* it shall be done—that a root should be filled immediately after removing a putrescent pulp from it? If so, the probabilities are that you will have an

abscess on that tooth. No tooth or root with putrescent remains in it should ever be permanently filled until there has been thorough and proven disinfection, and this is best accomplished: 1st, by free removal of dentin, and 2nd, by repeated root dressings of creosote. If you institute immediate root filling where you have removed a freshly devitalized pulp without treatment you may not know the difference for two or three years, but the time most likely will come when your patient will be made aware of the mistake.

Unless measures are instituted by the practitioner after pulp removal for the disinfection of these tubules (pointing to diagram), the time will probably come when decomposition of the matter in them and the intermediary substance will become a source of irritation, and trouble will ensue. In an old person it may not, but in a young subject, where the consolidation is not complete, sooner or later these results will follow. A much better method, and one that should be adopted for the treatment of roots to be used in this process of tightening loose lower front teeth, is to disinfect the internal portion of the tooth, and that is best accomplished by sealing creosote in the root for about twenty-four hours. By this procedure perfect comfort will result from using teeth in the manner to which I now purpose to direct attention.

Before attempting a description of this little appliance, allow me to answer a question asked a moment ago, while you were examining the practical case in the mouth of this patient, that properly belongs with what has been said and in this connection—"What do you fill roots with?" Let me change the form of the question and ask—What ought roots to be filled with, regardless of the practice of any one man? You will understand from what has been said that I attach little importance to the filling of a root, compared with the removal of the cause of root infection. We should give attention to the filling of the root, of course, but the importance of this operation has been unduly magnified.

When the root has been thoroughly disinfected, inasmuch as nothing detrimental can come down or up through the apical foramen, what special difference can it make as to what the root canal is filled with? The point of importance is *the disinfection of the root*, so as to place the cemental tissue in such condition that the pericemental membrane will take care of it, and so of the entire root. When we have these conditions it makes very little difference

what the root is filled with, but all things considered, I think the best root-filling material is a good oxychlorid of zinc.

Some lay great stress on gold for this purpose. What difference does it make whether we use gold, lead, tin-foil, or some other substance? Gold has nothing to do with the preservation of a root; and it is the *preservation* and not the *filling* of the root that we want. Gold has no influence in preserving the root from infection, but oxychlorid of zinc, itself a disinfectant, has, and it thus becomes the best material which can be used for this purpose.

Raw cotton saturated in creosote makes a good filling, especially for small tortuous roots. I have banished absorbent cotton from my office, as I do not believe in it at all. If there is anything in the dentinal portion of tooth which is infectious, the use of absorbent cotton in it will tend to draw same to itself, and the cotton may

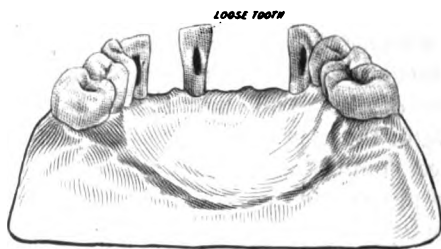


FIG 1.

eventually become infected and thus cause trouble. The fibers of raw cotton may be used without this danger. Saturating fibres of this cotton, twisted into a loose thread, with a thin preparation of oxychlorid of zinc for large roots, or with pure wood creosote for small roots, furnishes possibly the best root-filling material yet suggested.

But to turn now to this method for the mechanical tightening of loose teeth. Every one of us has cases in practice where the lower incisors have become loose from absorption of the alveolus, so loose as not only to disqualify them for service, but to render them a positive discomfort and annoyance to the patient. Such teeth mechanically fixed as to their crowns, and further absorption prevented, will do duty perfectly for years. The first step in these cases is the destruction of the pulps in the loose teeth and in two contiguous tight teeth—one on either side. The cuspids are gener-

ally to be preferred for supporting teeth, as they are the largest and most secure. It should be noted that if nature had planned to make the very best, shape of tooth for this kind of a support, she could not have done better than she has in giving form to the lower incisors and cuspids.

The first attempt I ever made to tighten such loose teeth was eighteen or twenty years ago, when in a single instance I cut down from the incisive edge between the two plates of enamel in two loose teeth and two tight ones, making a kind of gutter, into which I dropped a gold wire and filled around it as well as I could with foil. I cannot now imagine anything more clumsy, and yet it gave a kind of service for a number of years; but the accumulations upon the lingual faces of these teeth finally did their inevitable work and the whole thing—wire and teeth—came out. That experiment perhaps

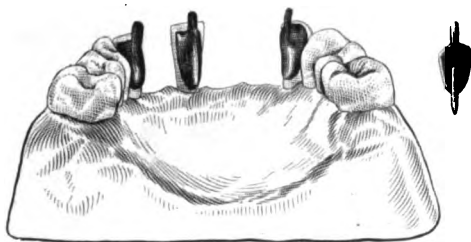


FIG. 2.

first gave me the idea that it was possible to continue loose teeth in service. My second attempt was much more on the order of the present system; it was the insertion of a missing right lower lateral. After devitalizing and entering the right cuspid and central from the lingual face, I formed a piece of gold wire into something like a large inverted U, soldering the tooth to the cross piece. The ends were adjusted to drop into the roots of the adjoining teeth, where they were secured with gutta-percha. This crude appliance, inserted some fifteen years ago, with the ear marks of the present system, is still in service.

The manner of opening into these teeth for making the arsenical application has already been described. Remove the enamel with a carborundum wheel at the point of entrance, sink drill-pit into dentin with sharp bur, enlarge and shape cavity until suited for holding arsenical application and for securing the temporary stopping. When devitalized, the entrance should be enlarged and made as

direct as possible to canal to admit a Gates-Glidden drill into the root. I have discarded broaches entirely for removing pulps. The drill not only removes the pulp tissue from the roots better, but enlarges the canal and removes the dentin, as already advocated, at the same time. The canal in these roots can be enlarged to admit No. 16, and frequently a No. 15, gold wire. This wire, of 20 carat gold, is sufficient for the support of any case. It should extend into the root from one-half to five-eighths of an inch and be so fitted that it will be stable without being tight. As before stated, we might almost think that nature had shaped these teeth with special reference to this system. Here, as you see (pointing to drawing), at the enlarged lingual part of the crown it can be cut away for more convenient entrance to the root, and to make room for the gold plate which is to form the lingual face of the tooth, without the slightest injury to the tooth.

Having shaped this lingual face as desired, a piece of pure gold



FIG. 3.

plate, No. 30 gauge, is roughly burnished onto it, a small hole made through this gold for the wire or post, and thus the gold back and post are brought into their proper relationship. They can then be waxed together and withdrawn for slight soldering. When the post and the thin back have been caught with solder, the gold-plate back should be carefully burnished into place on the tooth while holding the post firmly in position. The gold should now be trimmed and fitted, when it can be strengthened to any extent with solder.

For convenience in handling, and for certainty of withdrawal from the impression, the post of gold wire should always be left standing out of the tooth from one-fourth to three-eighths of an inch until the final finishing of the fixture. In more recent cases I allow the pure gold-plate back to cover the entire lingual face of each tooth except just at the cutting edge, where it is shortened to escape detection from the front. With each support carefully fitted and in place in its tooth, a perfect impression, which need embrace only the teeth involved, is secured in plaster. When this is withdrawn it should hold the supports in their proper positions, and be treated in the

usual way for making a cast, which is sometimes improperly called a "model."

Treatment of these cases at this stage has been to me until within the past year a most perplexing part of the work. Formerly I made these little casts of plaster, but this necessitated their withdrawal from the plaster teeth with all the attendant risk of displacement, before investing for soldering. It was a great comfort as well as a great gain when the suggestion came to me to make them and all kindred work of investment material. It may be well to speak of this article, there being so many kinds. I have never found anything so satisfactory as *coarse* silex—sold by the dealers—and plaster, in about the proportion of one part of silex to ten of plaster.

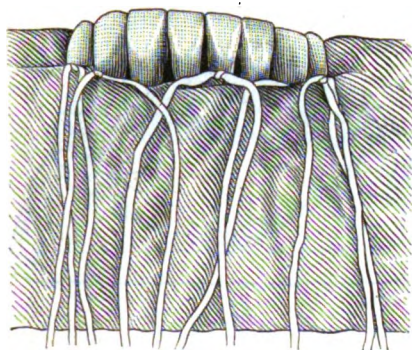


FIG. 4.

This will stand the fire far better than sand and plaster, or any other mixture that I know.

These supports, while thus in place on the original cast, and while in the exact relation they occupied on the teeth in the mouth, can be securely soldered together. All that now remains is to cut off the protruding portions of the posts, dress and finish the surface of the appliance, and it is ready to be placed in position. If teeth are to be supplied the same steps are taken until the impression is removed from the cast. At this point the teeth—cross-pins are the best—previously selected, are fitted to the cast. A stay or backing of thin pure gold is now accurately fitted onto the lingual face. (Here let me fix a little point: To hold this thin metal in contact with the tooth while burnishing it into place, first fit and burnish it as best you can, then remove and melt on the tooth a very thin coat

of some hard wax. When reburnishing for final adjustment the wax holds the stay in place and you are able to fit it to the tooth perfectly and in a moment's time. No harm comes from the use of the wax for this purpose, as it burns out completely in soldering, leaving no stain.) Having burnished the stay onto the tooth in this manner, with a sharp knife a shaving from two sides of the platinum pins should be cut down to the gold (the pins should not be bent over on the stay), to hold the stay securely in place and to assist the attachment of pins with the solder.

We are now to give the inner or lingual part of the porcelain facing the shape of the natural tooth. I use crown metal for making this, forming it into a half tube, as it were, fitting the sides to the stay and the end to the cast, so that when completed it will rest

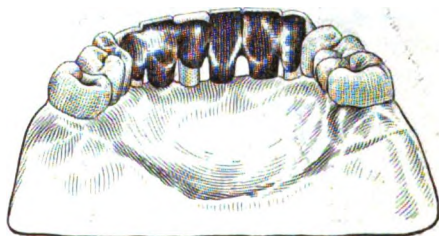


FIG. 5A.

lightly on the gum. The stay can be soldered to the pins and the half tube to the stay at one soldering. This done, it can be filed into the exact shape of the lingual portion of the natural tooth. Now burnish a piece of thin gold to cover the crown end of the opening, invest the tooth and solder from the inside of the tube. Dressing and finishing completes the making up of the tooth. It is now ready for its position on the cast, where it is to be invested and properly and securely soldered to the supports which are in position exactly as in the natural teeth in the mouth. When supports and teeth are soldered together, and the case is finished ready for insertion, the rubber dam is applied, as it can be in every instance, and the case cemented into place without haste or fear of moisture. If the claims regarding the new "Fellowship" cement prove to be well founded, as now seems likely, the application of the dam for setting these cases, when this cement is used, will be superfluous.

A thorough comprehension of the requirements of these cases, coupled with exactness and delicacy in manipulation, will in every instance produce most satisfactory results.

Discussion (New York Odontological Society). *Dr. Smith:* Dr. Jarvie asks how deep to drill, and I would reply that it makes no difference whether the cavity is deep or shallow, so long as we get to vital, sensitive dentin and have room for the application and the temporary stopping which is to secure it. The cavity should be so shaped as to positively secure the application. Just here I would emphasize the importance of the retaining medium, for I am satisfied that it has much to do with the effectiveness of the work of the arsenic on sensitive dentin. The arsenic must be *confined* in the

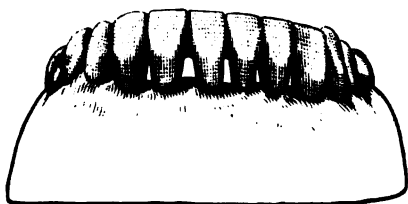


FIG. 5B.

cavity and be kept dry, cotton as a covering will not answer. Dr. Walker asks what I use to secure the bridges, and I would reply that I employ the best oxyphosphates I can get.

Dr. A. L. Northrop: Dr. Smith would give us to understand that whenever Dr. Atkinson went into the pulp cavity and root he perforated the apical foramen as a part of his treatment, but as I recollect Dr. Atkinson's statement, it was, that wherever there was an incipient abscess the quickest way to relieve it was to go through the foramen.

Dr. Smith: I am an enthusiastic admirer of Dr. Atkinson and his service to the profession, and I did not mean to misrepresent him.

Dr. G. A. Mills: Dr. Atkinson advocated going through the root only when there was a pathological condition; otherwise he went through the gum. I have followed this method for years.

Dr. S. G. Perry: I agree with Dr. Smith as to the importance of the root, for it can be crowned many times if necessary. Much attention should be paid to cleansing the root and disinfecting the

tubules. I am in accord with Dr. Smith's idea as to the devitalization of pulps, and think it is all foolishness to try to save them simply because they are alive. However, we should keep the pulps alive for a few years in the case of young people, so as to have a solidified tooth. As to the use of creosote, I have employed it since beginning practice. It is seldom that I fill a root immediately after extirpation of the pulp, although I have done so when the pulp has been devitalized or been taken out under the influence of cocain. Where the pulp has been dead some time I never think of such a thing. I use creosote whether the apical foramen is open or closed. For a quarter of a century I have never varied from the use of oxychlorid of zinc, when there is a closed foramen. When the foramen is open I close it with a small quantity of gutta-percha, so the oxychlorid will not be pushed through. In filling the canals I use fine gold wire made to fit the case as nearly as possible. Cross-cuts are made on it to hold the silk better, a very little silk is rolled on to it and dipped in the oxychlorid, and the wire is then pushed to the end of the root. This is the best filling for this purpose, and for a quarter of a century has given better results than any other. I have listened with much interest to the idea of applying arsenic to freshly cut dentin rather than to the exposed pulp. Where the pulp was not inflamed I have drilled into many teeth without much pain, using care and a very sharp instrument. If Dr. Smith says pulps can be devitalized by his method without causing pain, I am glad to hear it. As regards the operation which Dr. Smith has described, it seems practical and proper, and I am sure it will do well. There is no reason why it should not be performed oftener and do away with so many plates, clasps and bridges. Of course, it requires courage and a skillful hand to drill into sound teeth. I should like to hear more from Dr. Smith about this tightening of loose teeth, as it is a large question.

Dr. J. D. Thomas, Philadelphia: For several years my teeth were so sensitive that I could hardly eat the softest food. Dr. Smith destroyed the pulps in several of them, and both roots and teeth have been perfectly comfortable ever since. He cut through the enamel with a carborundum disk and drilled through the dentin, and the moment the sensitive dentin was reached he applied the arsenic. In forty-eight hours I returned for treatment, having suffered no pain, and was really surprised when the doctor told me that the pulps were removed.

DENTAL SCIENCE AND LITERATURE, REPORT OF
THE COMMITTEE.

BY G. V. BLACK, D.D.S., CHICAGO. READ BEFORE THE ILLINOIS STATE
DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

In planning a report on the dental literature of the year that has just passed I have been in some doubt as to what would best subserve the interest of this association. It seems to me that probably the most good would be done by speaking more particularly of the direction of thought, as shown by the literature offered, rather than reciting the particular things that have been done, or giving notice of the particular articles or books that have appeared. The function of books has come to be quite distinct from the function of journal literature. In the journals we introduce and try new subjects, and discuss the pros and cons of the old for the more immediate comparison of ideas. Books should register the more mature thought of the profession, that has in a greater degree been tried by comparison, discussions and usage. This is gradually becoming more nearly a fact than formerly, therefore books cannot be taken to represent the immediate or temporarily prevailing interests of the profession. These are represented by the journal literature. Professional books more nearly represent the graver and more permanent movements of thought as viewed in a series of years. As professional men our present interest is less in the particular books or articles that have been written than in the present trend of thought of the profession as a whole. I should have been glad to have been able to present more fully my views of this trend of thought, as shown by the literature published in the year; but to examine all of this literature for that purpose would have been too great a task. I have therefore taken five of the American journals that seem to me best adapted, and from an examination of the articles presented in these, as a test of the interest of the profession as shown by the journal literature, have based the conclusions that I will offer.

The year seems not to have given us special discoveries that will stand out in the future as landmarks in the progress of dental science or literature, but while this may be true, it is also true that much attention has been paid to our literature and a general activity has been noted among the writers and thinkers of the profession. I have collected a list of books that may be printed or

not, and have tabulated a little over 400 journal articles. I shall not recite either of these, believing that to do so would be of less interest to you than to give in a general way the impression that I have had from studying this literature. Of the books I shall speak of only one or two, and I may mention a very few of the journal articles. As to the general character of the literature, I may say that the writing shows continuous improvement in quality and in general character. While some articles appear that are disjointed and awkward in the literary sense, they are in the main earnest and instructive, and deserve the careful attention of every dentist.

For the most part the list of books will be passed without comment, but there are some things about which I feel like saying a word, particularly some criticisms that have been made which seem to be unjust regarding the work of Drs. Eckley, entitled "Regional Anatomy of the Head and Neck for Practitioners and Students of Dentistry." Some of these criticisms are curiosities in dental literature, for the reason that they have been made on the supposition that this book has been intended as the only book on anatomy to be placed in the hands of the dental student. The thought that a book on anatomy confined to the head and neck can be supposed by any teacher or writer of the present time to cover the subject of anatomy that the dental student should have is so far from my idea of the study that should be made of this subject that it is difficult for me to understand how such a criticism could be made. Certainly dental students of the present time should study anatomy as a whole. I know that such a thought never entered the minds of the authors, for I talked with them in regard to the book before it was written and while it was in preparation, and perhaps had to do with the suggestion that such a book be written. Certainly there was no thought or expression looking to the idea that the book should be the only one on anatomy for the dental student, but quite the reverse. Indeed, the character of the book is such that the student who has not had considerable study of the general subject will find much of it exceedingly difficult to read intelligently. It presupposes that the student has had considerable study of the general subject, and the evident intention of the book is to review those structures most important to the dental student, to the practical operations of the oral surgeon and to diagnosis. It is the first work attempted of this character, and the mistakes and omissions occurring in the

first edition may be corrected in future editions. My own notion has been that we need a regional anatomy for special use in an advanced course in oral surgery, special pathology and diagnosis. I am of the opinion that such a book should give the technique of surgical operations upon the cadaver and much that is not given in the work before us. Certainly such a work is needed at the present time. It is my belief that in the future we shall depend very much more on special works of this character than we have in the past, but let us have no thought that books with regional limitations are to be given our students for forming the groundwork of their dental education. They must have a full course in the anatomy and physiology of the human body.

The work on dental electricity by Dr. Custer seems to have been drawn out by the increased use of electricity by the profession, and although it must necessarily be improved because of the rapid advances that are now being made in the adaptation of electricity to our professional work, which will displace many of the present plans, it is certainly very good for the time and in a large degree necessary.

Some of the other books may also be regarded as very necessary, especially that on the internal structure of the face by Dr. M. H. Cryer, which is giving us a better understanding of the anatomical relations of the different portions and organs of the parts with which it deals; a book that should be carefully studied by every dentist.

It will be noticed in going over the list of books that a number of them are new editions of books previously published, most of which are improved and enlarged, and those who have the older editions will do well to have the new also.

The trend of thought of the profession is shown best by the journal literature, which is largely the outgrowth of the society meetings that have been held throughout the country during the past year. I may say, however, that a number of the best articles are those that have been written for journals and have not been read before societies. Still, many among the best are those that have been presented to the different associations. It is not my intention to make any distinction on this basis. There is a list of about 400 articles that have been published in five American journals: *The Dental Cosmos*, *Items of Interest*, *International Dental Journal*, *The Dental Digest* and *The Dental Review*. In

volume the matter is sufficient to make a considerable dental library, and it will be found in going over the articles somewhat carefully that almost every phase of dentistry has been covered partially and in some instances quite completely. If the whole were properly indexed, so that needed articles could be found in after-times, this literature would be much more valuable. These journal articles show very well the trend of thought that has been taking place during the year just passed. Some subjects have received great attention, and seem uppermost in the thought of the profession, while others that have been actively urged in years past have dropped out and we have lost sight of them in the literature of the year. It is very interesting to note these characteristics of our literature. If we should go back for fifty years and make an annual list of articles appearing on various subjects in dentistry we would find that some topics come to the front and are thoroughly discussed during a year or two or three, then drop out and are passed over for perhaps a dozen years, then come up again in some new form, or possibly in the old form, and are eagerly discussed for a time, and again drop out, giving place to other subjects. This I have noted particularly with some subjects, as, for instance, the capping of pulps, that for a series of years occupied the dental profession closely, and about which much was written and spoken. Then it dropped out for a time, to reappear later.

We would perhaps do well to divide the literature of the year into topics, without too great care as to the arrangement, and in a degree represent the interest that has been taken in various phases of each subject. To me one of the most interesting features of the literature of the past year is the increased attention that has been given to the subject of *dental education*. In the classification of the articles that appeared in the dental journals I was somewhat surprised to find that this leads all the rest in the number of papers that have been presented. It must be noted, however, that a considerable number of the articles are only indirectly on the subject of dental education, while many others touch upon it in such a general way as to be only a reflex, if I may so term it, of the main interest. But among them there are a number of papers that deal with the methods of teaching of certain subjects, and the management of dental school instruction, that are particularly instructive and calculated to give the profession a very good idea of the plans of teaching. Among the many excellent ones is that by Dr. C. C.

Chittenden on "The Dental College Standard" (*International*, 1901, page 485), which should attract especial attention. A considerable number of these articles are presidents' addresses. As I have read the articles from time to time I have been pleased with some, and again I have wished that these addresses might be ruled out and be placed on the shelf as things of the past. It seems to me that the function of the president's address at the opening of our meetings is to discuss dental education, either in a general way or some particular phase of it, but these compose but ten of the fifty-nine articles on it. After all, I do not know of a better way of opening a society meeting than with a pleasant address. Its function is not necessarily to instruct, as it may be simply light and racy, although upon occasion it may deal with the most weighty subjects.

Anatomy. The subject of anatomy as it appears in our journal literature of the year is confined almost entirely to the treatment of special phases of anatomy of the teeth or of evolution of the teeth. One of the most notable articles in the series of sixteen that has appeared upon this subject is by Dr. Miller of Berlin on the preparation of teeth and the jaws for the macroscopic study of the relation of the different tissues, bone, enamel, dentin and cement, to each other. (*Cosmos*, 1901, p. 1109.) These have been presented in colorings that distinguish the tissues very definitely and beautifully. This phase of the study of tooth tissue seems to be new and should attract general attention. I have seen these specimens and they are among the most beautiful that have come to my notice. The plans of coloring are applicable to the study of the teeth of both man and animals, and especially to the study of those teeth that have complicated infoldings of enamel and cementum, found in the teeth of those animals that live upon a vegetable food or grain. These plans may be used in displaying the different tissues of the human teeth in our technic work to great advantage. Plans of the study of the *minute anatomy of the teeth*, and particularly of the enamel, have been advancing quite rapidly during the year, and more interest seems to have been taken in it in its relation to operative dentistry than formerly. In this work Dr. F. B. Noyes has taken a somewhat prominent part. The study of the *mal-forms of the teeth* has called out several articles, one of which was presented to this society at the last meeting, another by Dr. Gilmer at the National Dental Asso-

ciation, and still another by Dr. Miller of Berlin. Dr. Gilmer has been particularly fortunate in obtaining several very rare odontomes in his surgical work, and in giving well illustrated descriptions of them. (DIGEST, Dec., 1901, p. 953.)

Bacteriology. The journal literature shows a considerable interest in this subject, which is perhaps not manifested so much by special articles as by the intermixture of allusions to bacteriology very frequently through papers on other subjects. The articles which I have noted have generally been on some special phase of the subject, such as sterilization of instruments, the management of such sterilization, the application of antiseptics, etc. Few papers have appeared in our general literature upon the cultivation or isolation of bacteria. Accounts of original studies are almost entirely absent. The literature that has appeared, however, shows the general interest of the profession, the need of a closer and wider teaching of the subject in our dental schools, and the necessity of a wiser application of methods in general practice.

Diseases of the Enamel and Dentin. The study of the diseases of the enamel and dentin still holds the interest of the profession closely, and a considerable number of articles have been confined to this subject. They are devoted mostly to caries and erosion. It is rather difficult to give in a few words the general trend of thought upon this subject, as it is one on which the mind of the profession is still varying considerably. There is much more tendency, however, to study the influences of the surroundings of the teeth than has formerly been noted. The thought of the profession seems slowly swinging in that direction.

Michaels' study of the saliva, and the possible relation of its chemical constituents to caries of the teeth, is drawing more and more the attention of the thinking members of the profession; though perhaps none of us knows just what to think of the matter, or where these studies are tending. To most of us they seem to be studies that are reaching far out into the borders of the unknown and are difficult to follow. There are few in the dental profession who are prepared to go deeply into this field of work or even to understand its purport. Its solutions will probably require years of work. We have some promise in a brief article by Dr. E. C. Kirk that he will have something further to present on this subject shortly, which we look forward to with great interest. This topic properly belongs to the general subject of

serum pathology, and requires a close inside study of what has been done in that line of work, as well as an intimate knowledge of chemistry in its relation to the life of force.

In the meantime the study of the immediate local conditions under which caries occurs in the mouth is going forward and attracting closer and closer observation of dentists. This is apparent not so much in special articles written upon caries of the teeth, as in articles that have appeared on operative dentistry in its various phases. In this study the relation of immunity and susceptibility to caries is attracting more and more attention, and especially is the condition of increasing immunity with increasing age being more looked for and expected as an aid in the treatment of caries as it occurs in young persons than formerly. This has been emphasized in a considerable number of articles that have appeared. The interest that was aroused in the study of microbic plaques and films by the papers of Dr. J. L. Williams a few years ago continues. This appears in a number of articles in relation to operative dentistry, and in some of the articles on caries; and notably in an article in the May, 1902, *Cosmos*, by Dr. Miller, in which he gives a considerable study of this subject with illustrations, that should be carefully read. Closely related to this I may mention the study of extension for prevention, so-called, that seems to be increasing in interest and influencing the preparation of cavities more and more as its object and its relation to the recurrence of caries is becoming better understood. This was especially accentuated by a series of discussions that was precipitated in New York and Chicago by Dr. Ottolengui, the editor of *Items of Interest*, and again through a paper by Dr. G. S. Allen and the discussions upon it. These discussions have been published mostly in the *Items* of 1901, beginning page 322. Dr. Allen's paper and the discussions will be found in the *International*, May, 1902.

In addition to these, a considerable number of articles has appeared touching upon the last two subjects in connection with *filling operations*. One of the best of these is by Dr. C. N. Johnson, entitled "Critical Periods in the History of the Human Teeth," and published in the *Digest* of August, 1901, page 541.

The force of the human bite in its relation to filling operations has also been discussed frequently in articles that have appeared, and is bringing about such modifications in cavity preparation as to make fillings stronger and more substantial than formerly. In con-

nection with the study of the local conditions under which caries occurs, there appears to be a greater interest developed in tooth forms than was apparent heretofore in our journal literature. This is accentuated by a number of articles in which the forms of the interproximate space are discussed, also other questions of this character leading directly to a closer study of the natural tooth forms and the condition as to forms which promote cleanliness of the surfaces of the teeth, and in this way tend to limit decay, and especially recurrence of decay about fillings.

In filling operations the study of the manipulation of gold has been continued, and appears frequently in articles that have been published during the year. There has been some tendency apparent to make greater use of the crystal forms of gold than formerly. This matter has a somewhat peculiar history. For the last forty years various forms of crystal gold have come up for discussion, have created great interest, have appeared prominently in dental literature for a time, then faded out to reappear, and have again dropped out; while gold foil has held its place with but little interruption. This leads us to suspect that this new interest in the crystal forms of gold that has been manifested within the last year or two will also disappear with a little more time. The discussion of *the amalgam question* is continued, but has been very much less prominent recently, and our literature of the year past gives few notable articles upon this subject. While amalgam is discussed in a very considerable number of papers in its relation to the treatment of caries and some other subjects in dentistry, the special articles are confined to about half a dozen.

In looking over the literature with reference to the *diseases of the dental pulp*, I have been particularly struck with the absence of articles on pulp treatment. This is so complete that one is apt to conclude that any attempt to treat exposed pulps other than by their destruction and removal has passed out of the minds of dental practitioners. I remember that in the Seventies our literature was full of plans of treatment for saving the life of exposed pulps, but now this is all changed and the treatment of exposed pulps discussed in our literature is almost entirely with reference to destruction and removal and the filling of root canals. I relate this simply as a fact noted which should make us think whether we are doing the best that can be done under the circumstances as they present in practice.

The methods of *treating and filling roots* have received con-

considerable attention and present very divergent thought. The plans of root filling in vogue would seem unsatisfactory as judged from the apparent search for new material and ideas of procedure. There has been considerable interest manifested in the test of root fillings, and examinations of root fillings that have been made purposely for such examinations, notably by the Northern Illinois Society at its meeting this year, and by the National Association at its last meeting in Milwaukee. It is somewhat remarkable that the results of these fillings have not been very satisfactory, indicating that improvement in this operation is very necessary.

The treatment of alveolar abscess has developed sufficient interest to bring out a number of articles devoted especially to that subject. It does not appear, however, that there has been anything unusual offered during the year or any new thought evolved as to the treatment of alveolar abscess.

In oral surgery there has been unusual activity. There is more disposition on the part of dentists to take up and treat lesions of the face in a surgical way than has been formerly expressed. Possibly this impression is given me because I have been brought in closer touch with it, but it seems to me that there are a greater number of persons who are ready to take up and operate on diseases of the antrum, fractures, cleft palate, hare-lip, etc. Our journal literature shows twenty-five articles upon these subjects during the past year, which I think is a greater number than usual, and certainly the number of operations of this kind performed by the dentists who make this more or less a specialty is much greater than heretofore. Indeed, there is an increased interest manifested in this class of surgical work that is attracting to it more dentists than formerly, so much so that the general surgeon is coming more and more to recognize the dental surgeon in this field of work. For this reason, if nothing else, the dentist is called upon to give closer attention to surgical diseases of the mouth and face, and certainly a decided improvement and an increasing interest is manifested in this direction. The tendency of thought in the dental profession and among the laity is more directly that the dentist should do this work than formerly, and evidently the trend with the general surgeon is in the same direction. This being true, dentists will be called upon to increase their information on these subjects even if they do not wish to perform the operations themselves, for there will be a greater number of cases coming to them for consideration and ref-

erence to proper persons for their treatment. In this a high degree of intelligence is being demanded by the people.

Orthodontia. During the year the work in orthodontia seems to have increased, and a much larger number of men is giving the subject careful attention, as is manifested by the thirty articles, by almost as many men, in the journals named. The tendency seems to be to make this a specialty in dentistry, and more men are giving their whole time to the subject. While this is true, the general profession is also apparently taking much more interest in it. While we cannot discuss definite features of improvement in orthodontia coming out during the year, there is certainly a rapid and general advancement in methods and appliances used. The fixtures are lighter without losing strength, and of better adaptation than formerly. Movements of the teeth are made with more certainty and with greater safety. This naturally calls out a higher appreciation of this work by the people and they avail themselves of the advantages to a greater degree. This is awakening more interest in the dental profession, and we have every reason to believe that this feature of dentistry will become much more important and remunerative than the ordinary lines of practice within a few years. Judging from the literature of the subject presented during the year, and private inquiry being made in regard to it, it would seem that this subject is exciting as much general interest as almost any other in dentistry, and particularly in the country districts dentists will need to do much more of it than in the past.

Pyorrhea Alveolaris. "What is pyorrhea alveolaris?" is a very frequent question in private, that seems also to be asked by some of the writers of the twelve articles that have appeared on the topic. Of all the subjects in dentistry there seems to be no other in which there is so much confusion of thought as this, which fact is manifested in the literature. It is seldom that two men have the same view, and the last year is no exception to the former rule. Some consider the so-called pyorrhea alveolaris a group of diseases differing in manifestations and requiring different treatment, others think differently and regard all of these as slightly different manifestations of the same pathological condition, still others seem to consider it as only a symptom of various pathological conditions. The confusion is so great that it is difficult to tell what is meant by pyorrhea alveolaris or by the large number of other names applied to the diseases of the peridental membrane beginning at the gingiva.

margin. It is earnestly to be hoped that some skillful man will arise and straighten out this difficulty and bring the profession to an understanding of the true nature of this condition, or these conditions. It is a disease that destroys more teeth perhaps than any other to-day.

Anesthetics. The study of anesthetics has not presented any considerable activity during the year. In the journals that I have named nine papers have appeared, and all of these but one are on general anesthetics, including chloroform, nitrous oxid, sulphuric ether and ethyl chlorid, the bulk of them being on nitrous oxid. It would seem that it is eminently the dental anesthetic. It is notable that in the year passed but one article appeared on local anesthetics, indicating that they are not so much thought of as they were a few years ago. In passing over the journals I noted particularly that I found no mention of cataphoresis, a subject that filled our journals a few years ago. So it is, subjects come up, become prominent, pass out of sight, to arise again probably within a few years.

Oral hygiene and prophylaxis has been treated with increased interest during the last year, not only as a topic of special study, but also as a matter of inquiry among the children in public schools. Very considerable interest in that direction has been manifested. The articles presented on it are not lengthy, nor of a great number—only fifteen during the year, yet the inquiry in this direction seems to have been greater than the number of papers would indicate. It has been actively pushed by some of our associations, and much printed matter has been circulated with reference to examinations as to the hygienic condition of school children's mouths, and a collection and tabulation of records intended to show the conditions found has been attempted. Much of the work seems to have been directed toward better education of the people along this line, which, if it can succeed in bringing about better conditions, is certainly very desirable.

Ethics and Jurisprudence. These seem to have interested the dental profession more this last year than formerly, and there is certainly a growing interest in the ethical relation of the members of the profession to each other and to their patients. This is manifested in a number of well-written articles. All of the five principal journals present from two to four papers on this subject during the year, which is above the average number. The articles that I have classified under jurisprudence relate for the most part to dental

laws, legislation and the decisions of courts under the dental laws. In this field there has been unusual activity, and the general profession will do well to look carefully into the tendencies. I would point out as especially important the recent decision of the Supreme Court of Wisconsin, published in the DIGEST for Jan., 1902, page 58, and in the reports of the Wisconsin State Board of Dental Examiners. This decision seems to confirm the power of state boards to regulate the operations of dental schools more completely than has heretofore been done.

The legal opinions recently given the Illinois State Board of Dental Examiners upon the Illinois Dental Law, published in the DENTAL DIGEST for April, will be a surprise to many dentists in this state. Under this opinion, which has the authority of law unless it should be reversed by a decision of the courts, our Illinois Law becomes very different from former interpretations and usage, the principal point of change being that under this opinion the classes of persons eligible to examination and license by the Board are limited to: 1st. Those who were practicing in this state at the time of the passage of the Law. 2d. Those who may come into this state from another state, having had ten years of legal practice in the state from which they come. 3d. Persons who are graduates in medicine. All other persons are debarred from examination. Graduates from reputable dental schools can be admitted to license by the Board without examination as heretofore.

There is perhaps no other subject that is arousing more attention to-day than *the working of porcelain* in its various phases of adaptation to dental purposes. This has been stimulated in a great degree by the invention of the electric furnace, which renders the baking of porcelain more certain and easier of accomplishment. Nowadays one who is properly equipped may bake a porcelain crown or inlay in a few minutes beside his chair, without the disturbance of an oven that would be noticed by his patient. The adaptation of porcelain inlays to the replacement of lost parts of a tooth in exposed positions and some features of dental prosthetics are taking a much wider range than formerly and are coming rapidly into greater use. I do not forget that porcelain has come to the front spasmodically a number of times within my memory, to fade away again and pass practically out of sight, but it seems to have come to the front recently in an adaptation that has in it so much more promise than formerly that there is more probability that it will

hold permanently in some of its forms. I find in the journals named twenty articles that may be regarded as upon porcelain or porcelain inlays; articles that discuss the qualities of porcelain particularly, as well as its adaptation to the special work in hand. This is aside from articles on porcelain crowns or bridges, and porcelain artificial teeth. In this discussion there is a curious fact noticeable. While the dentists of the eastern part of our country are generally inclined to use the low-fusing body, those of the western part are inclined to use the higher-fusing bodies. It seems singular that there should be local divisions upon such a subject.

In addition to this, porcelain is also discussed in twenty-two articles on crowns and bridges, and I notice a very good article by Dr. Hart J. Goslee in the *Items* of 1901, page 406, on the history of the development of crownwork; a paper of more than ordinary interest upon this subject. Among the twenty-two articles devoted to it in the *Items*, *Digest*, *Review* and *Cosmos*, there are many that are good, and the subject is well covered.

Prosthetic Dentistry. The interest in prosthetic dentistry is represented in twenty-one articles in the journals named. A revival, we may say, of interest in the topic. In the discussion of this subject, occlusion of the teeth and plans of obtaining correct occlusion have awakened unusual interest, perhaps more than any other point in prosthetic dentistry. Careful attention to the occlusion has given much more satisfaction to patients than was formerly the case. This is a subject that merits the careful study of every dentist, not only those who make their own plates or artificial teeth, but all who have anything to do with this subject.

Among the four hundred or more articles that have appeared in the journals named, a number of those that I would class as miscellaneous are very excellent, nearly all of them relating to some phase of dentistry; some on new instruments, some on new plans adapted to doing this thing or that, to the training of sight and touch, pot-pourri of hints and questions, the adaptation of electricity to annealing and melting, electrical metallurgy in dentistry, the relation of uric acid to disease, and especially to dental diseases, additions to dental medicine, the philosophy of failures of dentistry in particular regions of the world, etc.

I have spoken of the fact that the literary quality of the writing in dentistry has shown an improvement in late years. If we should go back over our literature for eighty-five years we would find that

some of our older writers were able to produce better matter from the literary standpoint than the bulk of those who wrote more recently or in the Sixties or Seventies and along in that period, but since that time there has again been a marked improvement in literary style, which seems to have lasted up to this time, and which we hope will continue in the future. Editors of our dental journals would do well to look after this matter.

I think one of the most notable improvements, however, is in the *illustrative work*. The pictures that have been made within the last ten years are very much better than those made formerly. There is a greater amount of illustrative work done, and it is very much better done than formerly, and I may say that there is no year in which the illustrative work in our dental journals or dental books published was so good as within the year just passed. The interest in this work is very great, and particularly is the interest in the development of photographic work in this line increasing from year to year. During this last year some very fine results have been produced, both in the displaying of histological structure and anatomical structure. The portraying of appliances, particularly of prosthetic crown and bridge work, illustrations of the plans and forming the parts of crowns and bridges in detail, are finely done. Much of this has been done either partially or in full by photography and photo-engraving, and is made to subserve an excellent purpose in illustrative school work in the form of lantern slides. The improvement of this particular line I consider very important and one that will give lasting and very necessary results in the future in dental education.

Discussion. *Dr. C. N. Johnson*, Chicago: There are only two or three points to which I should like to refer. One is in regard to the specialization in dental text-books. We see a great tendency to-day to specialize, not only in periodical literature, but in the dental books. Years ago we had Harris' "Practice and Principles" in a single volume; later we had a work in three volumes, "The American System of Dentistry," then a text-book on dental prosthesis and one on operative dentistry. The tendency now seems to specialize more than that, so we have books on given subjects. It is true that recently there has been a reissue of a book, probably more comprehensive in the list of subjects treated by it than any that has appeared for a long time, entitled "Disease and Injuries of the Human Teeth and their Treatment," by Drs. Smale and Coyler of London.

It contains more than six hundred illustrations, and takes up nearly every phase of the subject of dentistry, so far as the treatment of disease is concerned. However, in doing that I have been impressed with the fact that it is impossible within those bounds to adequately cover any of the subjects, so I am more and more in favor of specialization in dental literature.

Just one word with regard to extremes in practice. Dr. Black mentions the almost total absence from our periodical literature of any mention of methods to save pulps by capping. As he said, it is a subject that some years ago was very warmly discussed, but apparently has dropped out almost completely, and the impression is that the profession to-day is not trying to save pulps. I fear very much that we have gone to an extreme, and in many instances have lost sight, not only in our practice, but in the literature, of the fact that the best service to the patient can frequently be given by an attempt to save the pulps alive.

Another encouraging thing mentioned in the report is the tendency on the part of the medical profession and the laity to give more credit to dentistry as it relates to oral surgery in the treatment of diseases of the mouth. Where surgery is called for, these cases are being more and more turned over to the dentist, and while there has been some complaint in the past that medical men have not recognized the true function of the dental profession, I feel that it is rapidly passing away. The following case recently came to my notice: A physician had referred to him a patient with some disease of the mouth, probably caries, whom another physician had had under treatment for months, and who was very much debilitated. The second physician, who was also a surgeon, referred the patient to a dentist, who gave the opinion that he believed an operation was needed. He was thereupon asked to perform the operation himself, and he did so, with the surgeon looking on. After the operation the surgeon told the patient that if he ever wanted anything done to his mouth he should go to a dentist, and I believe that is the sentiment among the best men in the medical profession to-day.

In regard to the confusion in the treatment of pyorrhea alveolaris, and the diseases that come under this head, if there is anything the dental profession has to censure itself for, it is its utter ignorance in regard to this disease. There is no disease in medicine of which physicians are so ignorant as are dentists of pyorrhea, and we seem to be as ignorant in the essentials of its etiology to-day as we were

ten years ago. We have the theories of different men, but as Black said, it yet remains for some one to give us from careful investigation a systematic and complete statement of the etiology of the disease and properly classify it.

The report touched in two places on the preparation of papers for the journals, and the function of the editor in editing the papers. As an editor, I want to say that in my experience I have never come in contact with a body of men so utterly irresponsible and careless with regard to the character of matter they turn in to the journals as are dentists. The editor is frequently to blame for mistakes, but if the writers would do only a fraction of their part there would not be one-tenth as much complaint as there now is. Remember, the editor has the absolute right to print what he pleases in his own journal and to change the nomenclature of an article to conform to the journal's style, provided, of course, he does not change the sense or make it ungrammatical. Frequently, we receive papers written by men who apparently have never had an introduction to a grammar. We must take those papers and laboriously straighten them out by practically rewriting the whole thing when the papers are published, and we next meet one of the authors, he says: "Really, I had no idea that paper of mine would read so well in print. I dashed it off in a hurry, but it came out all right after all. Guess I'll send you another some day," which makes the editor wish he had never been born—of course, I mean that the editor wishes that he, personally, had never been born.

Dr. C. E. Bentley, Chicago: The logic of this paper seems to sum itself up into the fact that the mechanical side of dentistry has had a great preference over the scientific side. There are many reasons for this, and there are also many reasons why this condition will be reversed. Some years ago it was my pleasure to read before this society a paper on the forecast of coming years, and I predicted at that time that scientific work would occupy a prominent place in our thoughts in the years to come. If the work of Drs. Michaels and Kirk indicates anything, we seem to be upon the threshold of this realization. A tone of pathos comes from the consideration of pyorrhea alveolaris, and Dr. Johnson is correct in his criticism of the profession on this point. The outlook for dental hygiene is encouraging, as the number of papers written shows that this much-neglected subject is now having a sort of universal recognition through the country. One of the hopes

things, coming from so conservative a man as Dr. Black, is his recognition of the value of porcelain inlay work. It is also significant that he particularly emphasizes the fact that the revival of interest in prosthetic work is centering around that important thing called occlusion, showing that the most essential fact in prosthetic work is that the occlusion shall be based upon scientific principles. I believe that the men now working along that line will give us something of a scientific nature that will bring prosthetic dentistry into the high consideration which it deserves. The most scientific tendency mentioned in the report was that the greatest number of papers have been upon the subject of dental education. This means a great deal to us. It is astounding to think what wonderful progress has been made during the lifetime of all present, and to realize that the physician is required to stay only four years in college, while the dentist must stay an equal number of years to master the knowledge of the ills that occur in only a small part of the body. In some things the East is arrayed against the West. At a recent symposium in the East on porcelain inlays, every man but one endorsed low-fusing body, and at a similar symposium in Chicago every man endorsed high-fusing body. "Extension for prevention" was severely arraigned at a recent symposium in New York, but the West has endorsed that benign method of practice. I cannot understand why the East and West should not agree on these points.

Dr. Geo. W. Cook, Chicago: In reply to Dr. Johnson, there are a number of diseases of which the medical profession is much more ignorant than is the dental profession of pyorrhea alveolaris. This subject hinges upon two points, and the day is not far off when they will be brought out by someone. It is necessary for the growth and development of the science of disease, or the science of a particular disease, that there be a great deal of wandering about the subject and that many methods and remedies be suggested, before it can be clearly elucidated.

Dr. Black, closing discussion: As regards the editing of dental papers, I think the general proposition as stated by Dr. Johnson is fairly correct, although there is danger of carrying it too far. The correction of papers with regard to the literary style should be rigidly exercised, and in some cases it is not exercised strongly enough. The editors have my sympathy on this point, for I know what an immense task it must be to reduce to presentable form

some papers that I have seen. Nevertheless, those papers may contain excellent and important ideas. The authors have thought well enough, but have not put their thoughts into readable language.

EMBRYOLOGY OF THE DENTAL PULP.

R. R. ANDREWS, A.M., D.D.S., CAMBRIDGE, MASS. READ BEFORE SECTION
ON STOMATOLOGY, AMERICAN MEDICAL ASSOCIATION,
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I shall consider at this time the dental pulp in its embryological aspect. Such an aspect appeals to me the more strongly from the fact that I have given special attention in earlier research work to dental embryology. In a general way, I shall consider the growth of the dentin germ from the earliest signs of its development, the formation of the dentin from the germ, and lastly, the fully formed and functionally mature pulp.

At about the end of the second and beginning of the third month of intrauterine life, in the embryonic tissue of the jaw, we shall find the primary specialization of cells which are to form the dentin germ and from which come the cells which afterwards form the dental pulp. It is in no special zone or layer of this connective tissue that the dental germ is formed, but the formation seems wholly influenced by the contact with an enamel organ. In the presence of this organ the connective tissue cells become stimulated and active. It would appear as though they offered a resistance to its further growth, and from this resistance the enamel organ were made to expand, thus becoming flattened and broadened. The stimulation and activity of the cells is shown by their rapid growth, which crowds the part at this point, becoming a dense focus of new growth. The tissue is seen to be actively building itself up, and this results in the formation of a papilla, around which the enamel organ is growing like a cap or helmet. This process of new growth is a beautiful illustration of anabolic metabolism. The papilla grows to a cusp or cusps, and now becomes the dentin germ. At the end of the third and at the beginning of the fourth month, the dentin germ is rather a homogeneous structure. Round cells are very numerous; they have relatively large nuclei and nucleoli. As the germ assumes the cusp shape, multiplication of cells takes place around the blood vessels, which have grown into the base of the germ, and a jelly-like layer has formed around its outer surface. It will

found that the dental germ will grow into the depressions of the enamel organ of a bicuspid or molar tooth, and these growths will become the dentin cusps. We also notice that the different layers of the enamel organ are now formed, and that the sacculus is now forming its layers about both enamel organ and dentin germ. When this process is completed these are enclosed in a sac, and thus become a dental follicle. Within the area of the dentin germ are contained all of the cells which shall develop later into the mature dentin, and into the pulp of the fully formed tooth.

The round cells around the rim of the dentin papilla appear to be in a protoplasmic substance, sometimes called a zone of amorphous material. It is a hyalin structure on the outermost surface of the germ. The cells just within become richer in protoplasm, and many processes are seen to be forming from them. They are becoming branched cells, a little later the cells at the surface grow larger and assume a columnar shape which may be caused by mechanical compression. We also see just within this layer of cells some that are pear-shaped, conical, cylindrical and spindle-shaped. There are some authorities who have spoken of what they call elementary cells on the outer layers, and from which they say the odontoblasts are formed, but I have never observed anything but globular masses that are not cells, and which are found in the protoplasmic substance of the rim spoken of above. At the beginning of the fifth month these cells on the surface are seen to be undergoing a histologic differentiation, as stated above, and are becoming specialized or formative cells, the odontoblasts. They are membraneless and little more than masses of protoplasm, which are seen to be filled with great numbers of bright, glistening globules of different sizes. The so-called "conjugation cells" of the German authorities are what I believe to be the pear-shaped fiber-forming cells. These are seen to be sending their processes into the intercellular spaces of the odontoblasts, and thus I believe the fiber to be formed. At this time dentinification is about to begin. How does this process of calcification take place? This we do not wholly understand, nor do we understand the chemical or physical properties of the building materials. At this time the blood supply is evident, and at the seventh month there is a perfect vascular system consisting of arteries, veins and capillary network.

As I have said, the details of the vascular mechanism by which the odontoblasts are supplied with lime necessary to form calcified

structure have not as yet been clearly worked out. Capillaries in the formative cells do not communicate directly with the cells, and must therefore pass the lime through the intracellular substance. The inorganic calcium which is necessary manifestly cannot be supplied as such by the organic formative cells, but must make its initial entrance into the body from without. This entrance in the fetal state must necessarily be through the maternal circulation, and after birth it must come from the food which passes through the alimentary canal. From here it must be carried to the specialized formative cells which superintend the process of dentinification, and there is but one such distributor, the blood supply.

After the absorption of food into the circulation by the intestinal epithelium, chemical analysis of the blood shows the presence of the calcium salts, the insoluble phosphate ($\text{Ca}_3(\text{PO}_4)_2$), and the soluble carbonate ($\text{CaH}_2(\text{CO}_3)_2$). It can be readily understood that the soluble carbonate can be absorbed, but how the insoluble phosphate can be absorbed is still a mooted question. It is believed, however, that it is absorbed in that same loose chemical combination with the proteid in which it is found before absorption in the casein of milk and the yolk of egg. Chemical analysis has shown these two foods to be very rich in calcium. The casein and caseinogen of cow's milk, according to Bunge, contains more calcium to the liter than does lime water. Caseinogen, according to Soldner, contains 1.2 to 2.36 per cent of calcium. The proportion of calcium in combination with the proteid of egg-yolk has been found to be about the same.

The loose calcium-proteid combination, arriving during its passage through the dental pulp capillaries within the radius of the special physiologic motive force of the odontoblasts, is acted on by this vital force, and thus becomes ingested by the cells. We believe that it here becomes modified by the cytoplasm of the cell, by a chemical combination with its organic substance, and in this way calcispherites are formed. Within the cells these globules seem to have the property of coalescing, and as they are placed by the cell again on the surface to become calcified they are found to be in many cases large globular or irregular-shaped masses. These masses, merging with others, smooth out and form the layer always found between the organic and calcified tissues, where the process of calcification is taking place. This is the layer known to investigators as bordering the enamel and tissue. Hoppe-Seyler asserts that the lime which hardens bone

dentin and enamel is a double salt of carbonate and phosphate of calcium, having the formula $\text{Ca}_2\text{CO}_3 (\text{PO}_4)_2$, one equivalent of calcium carbonate with three equivalents of calcium phosphate.

The various processes of dentinification have been demonstrated to me by many hundreds of sections cut from developing teeth, at a time when calcification was beginning, and from tissue prepared as near the life of the animal as it could be, and prepared with the least possible manipulation consistent with perfect specimens.

The formation of dentin from the dentin germ proceeds substantially in the following manner: We notice that the hyalin substance on the rim of the germ, which is a protoplasmic basis substance that surrounds the outer ends of the formative cells, is filling up with glistening, irregular-shaped masses that appear semisolid, many of them being globular, but all tending to form a layer of substance which is involving a portion of the outer ends of the odontoblasts. We notice that these cells themselves are filling with bright but minute globular bodies, which are the calcospherites, that seem to have their origin within the cytoplasm of the cell; these grow larger, probably by merging with others, as they are conveyed to the calcifying surface of the layer of the rim. Mr. Mummery of London has described a network of connective tissue fibers which was seen in bundles between the odontoblasts, and even enveloping them and passing out from them, forming a network just in advance of the main line of calcification. This network of fibers, the fibers of Mummery, serves during the formation of the layers of dentin matrix as a scaffolding, among which the gelatinous tissue and the calcospherites are deposited. I have described a similar network in developing enamel, in a paper read in Berlin in 1890. In this way the calcifying layers are formed until the dentin is completely calcified. This process is not continuous, but occurs in laminæ, as indicated by the contour lines seen in the forming specimens that have been stained. The layer which is forming is a new product in which the lime is held in some sort of a chemical combination. In this condition it is known to be calcoglobulin, and a further chemical change forms it into the fully calcified structure. Thus the dentin is formed, layer by layer and stage by stage. We cut our sections, if we are studying the forming dentin, at a period of growth covering one of these stages, and we do not always get the same picture. Sometimes our section will show the globular formation stage, sometimes in the stage that shows the continuous band of calcoglobulin,

and sometimes, though rarely, we get a picture that shows no appreciable layer between the odontoblasts and the calcified dentin. Suduth has stated that the thickening of the dentinal wall is accomplished by a single layer of odontoblasts which begin the process, and that these same cells persist throughout the life of the pulp. I cannot with my present knowledge agree with this statement, for I have seen earlier layers of odontoblasts being apparently used up or engulfed within the layer forming, and other formative cells developing from the cells of the pulp tissue just within. Oblique sections of forming dentin, and of the layer of borderland tissue, also show parts of the formative cells which have become fused with it. Dr. Frank Abbott makes the statement that he has seen from time to time dentin-forming cells replaced by others which, he says, are seen to be forming at their inner side. The layer of calcoglobulin has been called collagen; I do not believe that it is collagen. It was also formerly known as the "membrana preformativa," but this is not a membrane. The layer of odontoblasts was also known as a membrane, the "membrana eboris;" neither is this a membrane. Morganstern calls the layer of borderland tissue "dentinogenous substance," and thinks that it is produced by the odontoblasts giving up part of their substance, and that a segmentation of the odontoblasts has taken place, somewhat as the enamel rod is formed into segments.

There appears to be a lack of knowledge about the dental fiber, its canal and the so-called sheaths of Neumann. We speak of the dentin tubes, or of the dentin tubuli. A tube is any long and hollow cylinder—a pipe; tube or tubulus is certainly a misnomer. We should speak of it as the dentinal canal or dentinal canaliculus, for a canal is a duct in a body for the passage of fluids, a duct through which anything may be conducted. If we examine the cross section of the developing tooth again, where only a narrow layer of dentin has been formed, we see on the edge of the fully calcified layer, between it and the formative cells, the transparent hyalin layer already spoken of. It is somewhat irregular, as if it were formed by the merging of globular masses, a transitional tissue, mind you, which a further stage in the hardening process will completely calcify. It then becomes matrix or basis substance. It is formed by microscopic globules, calcospherites, within the odontoblasts. These cells appear to superintend the laying of the globules which are arranged in the substance of the gelatinous tissue, a layer of which has been

formed by the pulp to receive them; they are deposited against the fully calcified matrix within the fibers of Mummery. This is the hyalin layer already spoken of. It is a layer of borderland tissue that is singularly indestructible in acids or in caustic alkalis. I have already stated that there appear to be two kinds of cells concerned in the formation of dentin; one, a fiber-forming cell, with a long process running into the canals; the other, a matrix-forming cell, the true odontoblast. This is usually square and abrupt against the dentin, and the process or processes which it appears to have, in many cases I have found belong to the fiber cells deeper within the pulp tissue. As the dentin layer forms, the fiber of the fiber cell lengthens, and against the surface or sides of this lengthening fiber the same hyalin layer is left uncalcified, as is found against the forming matrix next the formative pulp.

We frequently see two fiber cells merged into one, caused by the lessening circumference of the forming dentin; they have merged together, one losing its identity completely at that point, and so it is with the odontoblasts. It appears to me clear that all the branching of the canaliculi must be from the merging of these fiber cells, thus forming branches of the main fiber. The so-called sheath, then, is a transition tissue, probably the same as the tissue which remains uncalcified in the interglobular spaces in dentin. It is in no sense a separate tissue, and sheaths can be demonstrated only after full decalcification, when acids have completely destroyed the matrix. In cross section of the canals in dentin this borderland tissue can be stained by a preparation of nitrate of silver. It acts precisely the same as it does on the hyalin layer of forming dentin; it stains it black. Both tissues are matrix tissues in a partial state of calcification, and full calcification will take place in this borderland tissue against the fiber as age comes on, when the dentinal canals are found to be much smaller in diameter than they are in the young tooth. We may assume, then, that the so-called sheath of Neumann is but a transitional tissue only partially calcified, which may fully calcify in the future. It lines the canals in the dentinal matrix, and is only a sheath when acids have destroyed its adjoining more fully calcified substance.

In these various processes we have considered the calcification of the deciduous central incisor. The process begins about the fourth month, the crown is nearly formed at birth, and the tooth root fully formed at the eighteenth month. Thus far it has been my purpose

to describe the various processes of dentinification taking place before and after birth, as demonstrated by research work. In describing these it has seemed necessary to repeat descriptions in order to make the subject matter clear. In concluding, a brief description of the germ tissue remaining after full calcification has taken place will be given. This germ tissue now becomes the normal pulp, which is the source of nutrition and nerve supply to the tooth. The main mass of this organ is made up of a semigelatinous matrix thickly studded with cells which do not in themselves form a continuous tissue, that is, they are not in contact with each other. They are imbedded in a jelly-like substance, in which many fine fibers are seen. In the center of the pulp tissue the cells are less numerous than they are near the formed dentin. The cells against the dentin are no longer square and abrupt against it. They are now oval or pear-shaped, with the pointed ends conveying a fiber to a canal in the calcified matrix.

The study of many sections of the pulp of fully formed teeth has led me to believe that the pear-shaped cells fringing the outer surface of the pulp, and having fibers running into the canals of the dentin matrix, are not cells having the same functions as had the formative cells, or odontoblasts, which were square and abrupt against dentin while it was forming. There are indications that the pear-shaped fiber cells have a membrane, and they remain pear-shaped throughout the vitality of the pulp. When the pulp is irritated by the approach of caries, or from abrasion, or from some stimulation from without, the fiber cells do not appear to take part in the formation of secondary dentin, the dentin of repair; but new formative cells are seen to be developing from the cells of the so-called conjugation layer just within.

Weil has described an intermediary layer just within the odontoblastic layer, which consists of a large accumulation of spindle-shaped cells, somewhat different from the embryonic connective tissue cells of the main mass, which varies in breadth according to age. This intermediary layer represents the remains of what the Germans call the conjugation cell layer, a layer of reserve material, which seems to be a product of the growth changes of the pulp. I doubt if there is more than a remnant of it in adult teeth. Some authors assert that the cells in the center of the pulp degenerate, that the nucleus disappears, and that there is a partial loss of their protoplasm. This is undoubtedly the case in older pulps which no longer

show the rich ramifications that the younger ones do. Lymphatic vessels have never been demonstrated with certainty in the pulp tissue. There is a network of undulating fibers which run from the root to the crown, parallel to the axis of the tooth. The interspaces between these cells and fibers being filled with a protoplasmic substance, their histologic nature has not been determined. It is stated that the cells of the pulp show characteristic differentiation at different times in its life. There are three kinds of cells which have their origin from the embryonic connective tissue cells by metamorphosis. These are round cells with large nucleus and scanty protoplasm; spindle-shaped cells; and irregularly-shaped cells, which have branching processes that freely anastomose with the spindle-shaped cells and with themselves. The changes in the cells seem to begin at the periphery and proceed toward the center of the pulp. At the periphery we have the pear-shaped cells, then the spindle-shaped conjugation layer of cells, then the spindle-shaped and irregularly-shaped cells with their anastomosing processes, and lastly, the connective tissue elements in the central portion of the pulp, which seem to be scant in protoplasm. These cells are not very numerous and are in a jelly-like matrix. The blood vessels enter at the apex, the trunk vessels resting near the center of the pulp. Sometimes as many as three arteries are seen to enter the apical foramen. They then divide into innumerable branches, and form an extensive network of capillaries near the layer of the pear-shaped cells next the formed dentin. There are numerous veins also found, and these are somewhat larger than the arteries. Black tells us that the blood vessels of the pulp are remarkable for the thinness of their walls, and that the smaller veins seem to be nothing more than endothelial cells which are placed edge on edge, or margin on margin. The arteries have a circular and longitudinal layer of muscular fibers, but these are very thinly distributed. The capillary network is so rich near the pear-shaped cells in the forming tooth that when they are injected and shown under the microscope there seems to be little room for any other tissue. The nerves of the pulp are many, the fibers being medullated and non-medullated, which enter the pulp through the apical foramen in bundles of various sizes. As they pass into the pulp they break into branches and form a rich network, a delicate plexus of fine nerve filaments next the outer pear-shaped cells. It is not known just how these communicate with the fibril. It has been asserted that the finer fibers may pass between the pear-

shaped cells and wind themselves around the dentinal fibrils, passing thus into the canal. Sudduth inclines to the view that the terminal fibers unite with the pear-shaped fiber cells, and that sensation is thus transmitted by the dentinal fibril to the terminal branches of the nerves. In form a mature pulp is shaped nearly the same as the tooth to which it belongs.

ELECTRIC OZONATION IN NEURALGIA.

BY G. LENOX CURTIS, M. D., NEW YORK CITY. READ BEFORE SECTION
ON STOMATOLOGY, AMERICAN MEDICAL ASSOCIATION,
JUNE 10-13, 1902:

The term neuralgia may be applied to all pains found in animal tissue that may be regarded as being nearly or quite in a perfect physical condition, especially if the pains have become chronic. To designate the locality of the cause of pain, which may or may not be in the region of pain, and leaving out what may be regarded as functional disturbance, we may mention, for illustration of my subject, facial neuralgia, gastralgia, myalgia, as of the pain in myelitis and pyelitis, all of which are only different phases of disturbances called neuralgia. The locality of the keenest pains may be in the parts suggested by those names, or they may be at greater or less distance. Neuralgia in and about the face and mouth is generally easily determined, but there are cases where there seem to be complications.

Other forms of pain, such as gout, rheumatism, sciatica and lumbago, may all come under the general terms of affections of the nerves and may all be treated in connection. But this would open a wider field than I desire to discuss at this time.

The pain about a tooth in one jaw may cause pain in the opposite jaw. It is well known that a defective lower posterior tooth often causes pain in the upper tooth. But it may be said that in cases of pulpitis, gingivitis, periostitis and pericementitis, the pains are found in the parts involved. As these latter forms of neuralgia are probably the ones that will most interest this section of medicine. I will confine my remarks mainly to them. My aim is to call attention to the power of electric ozonation; its effect upon this disease I regard as a comparatively new phase of practice in medicine.

Explanation of the remedial action. After three years of experimental work I called the attention of the medical profession, in

October, 1901, to it in a paper read before the Academy of Medicine in New York. In that paper the plan by which ozone may be properly made, and at the same time enable the practitioner to force it directly into and through the affected parts, was clearly set forth. I also explained its effects and gave report of cases in which the stimulating and ozonizing speedily reestablished the normal functions. When nerve force and proper nutrition are established, and equilibrium is reestablished, a high condition of health is the result. I do not wish to be understood as saying that by electric ozonation a normal physical condition can be reestablished in a diseased organ, such as follows the loss of tubules in chronic nephritis, abscesses of the lungs and liver, or a cicatrix in a nerve trunk following a traumatic lesion or calcaric deposit in the pulp of a tooth. But I do imply that by electric ozonation nerve force and circulation can be sufficiently reestablished in the parts to lead to health, and then be left in the best condition possible under the circumstances.

Method of application. The mechanism that will make this remarkable element is a system of coils of fine wire, so arranged as to change the quality of the current of electricity from the street into the wonderful therapeutic agent. One of the changes in the electric current effected by passing through the machine is increase of voltage, while at the same time the amperage is reduced, thus causing a high tension current. The capacity of this machine is 1,000,000 volts and about 1-50 of an ampere, capable of producing a large amount of ozone. The higher the voltage and the lower the amperage, the less is the degree of shock experienced by the patient. It reestablishes nervous functional activity, thus stimulating tissue repair. The current from this machine, which seemingly has but a single pole, passes through the body and then escapes into the atmosphere, which may be regarded as a negative pole.

Among the advantages of this machine is easy handling, that is, it is easily carried about when traveling. The fact that it may be used wherever there is an incandescent current, without its being affected by conditions of the weather, is an important virtue.

Reflex neuralgias. Removing the cause of neuralgia generally stops pain; for illustration, the removing of a pulpstone, necrosed bone, an irritating filling, gas in pulp chamber or alveolar abscess pressure; but there are cases that require the element of greater length of time, before unanimity is established, and electric ozonation tends to shorten this time.

Among other disturbances of the nervous system that may be mentioned are those that cause hemiplegia and catalepsy; but association with other disturbances sometimes embarrass diagnosis. I recall a case of hemiplegia supposed to be from brain lesion that was completely dissipated after the removal of an alveolar abscess. I also recall a case of catalepsy, from the same cause. Slight irritation may not cause neuralgia, when vital force is at par, but when vitality is low, neuralgia in most any part of the system may continue and lead to neurasthenia.

Neuralgia from asthenia. While investigating the cause of pain, for the purpose of giving relief, the practitioner generally believes that the pain is the result of a lesion. Should lesion not be found, I think that the practitioner should never operate for relief until a careful and exhaustive examination of the patient's system is made and he has ascertained the full conditions of health. This examination may show that the patient is in a very debilitated condition, and the vitality so low that there is not sufficient supply of nerve force for a high condition of health. Under such circumstances the overworked and inflamed nervous system needs assistance, and as pain is nature's voice calling for help, it may be regarded a blessing in disguise.

Illustrative cases. To illustrate the importance of making careful diagnosis, and to show how we may help nature, I will present two cases recently in my practice, one in which a lesion was determined, the other in which a lack of vital force was the cause of the pain. Mr. I., aged 80, had suffered for twenty-five years from facial neuralgia of a very acute character. All his teeth, one after another, had been extracted, without giving any abatement of the excruciating agony. Under these conditions his health gradually failed, and the paroxysms of pain became more and more intense until continued agony made his life hardly worth preserving. This was his condition when brought to me by his physician for consultation, regarding advisability of resection of the lower dental nerve. On a careful examination I found that his nervous system was in a very feeble condition, and with its present capabilities would not generate enough nerve force to furnish half the vitality necessary for even a moderate condition of health. It was clear to me that his nervous system must be awakened and made more vigorous before improvement could be seen. I suggested a course of ozonation, and the advice was acted on. After two weeks of daily ozonation his general

health had improved to a marked degree, and with this change rapidly came the gratifying result—entire freedom from pain. This ozonation treatment was continued two weeks longer, when sound health was firmly established. This highly satisfactory condition lasted a year, when the death of a dear member of his family caused him great sorrow, and necessitated a long and fatiguing journey by railroad. The grief and journey combined so exhausted his vitality that neuralgic pain was again felt in full force. He came to me again for treatment and was treated by the same method, and was again restored to vigorous health. He now continues to live and enjoy life free from pain.

Another case was that of Mrs. E., who had for twelve years before I saw her been subject to long periods of suffering from neuralgia in one side of the face. She had, one at a time, all the molars extracted without gaining relief. During the examination I asked her what had been the condition of her general health. She replied that her "health was good," but her nervous, anxious expression contradicted her assertion, and showed clearly the irritable state of her system. I continued my examination and concluded the cause to be pulp stones in the upper bicuspid of the affected side, and advised the removal of the pulps, or possibly extraction of the teeth. I found her vitality very low, none of the functions of her organs performing regularly, thus showing that a patient's word cannot always be relied on in such matters. In no sense was she a well woman. She would not consent to surgical treatment that seemed proper, but after the ozone treatment was suggested she concluded to accept it. After the second treatment all signs of pain in the parts disappeared, and after a month of treatment her general health was seemingly entirely restored, and for two months she was free from pain. But later contracting a violent cold, and the bicuspid becoming troublesome, with slight paroxysms of pain, she again came to me for relief. After several ozone treatments all pain disappeared. When last I saw her she was in good health, and had no returns of the neuralgia. I believe, however, that until the pulp stones are removed she will occasionally have a recurrence of the pains when her vitality runs low. I may mention that previous to the time she came to me she was considering the resection of the Gasserian ganglion.

I have observed similar results in other cases.

Discussion. *Dr. J. L. Williams*, Boston: What is the process of ozone treatment?

Dr. Curtis: Briefly stated, the treatment consists of forcing the ozone into and through the body by means of Geisler vacuum tubes. These tubes are of various shapes and adapted to the parts to be treated. The ozone, which I believe is electricity, as it passes through the body oxidizes the pathogenic conditions not only in the tissues, but in the blood. It reestablishes circulation in a congested part and promotes nutrition, so that the blood is very quickly purified and new blood rapidly generated.

Dr. Bogue: Is not ozone produced by the atmosphere?

Dr. Curtis: One of the principal elements of the atmosphere is ozone. Nascent ozone is said to be produced by a strong current of electricity coming in contact with the atmosphere, breaking up the molecules of oxygen, thus liberating the ozone.

Dr. G. F. Eames, Boston: I have always understood that ozone, an excess of oxygen, is produced by the electric current acting on the atmosphere, and it is easy to see how it may be taken into the lungs by inhalation, and thence into the blood and to all the tissues through which it circulates, but it has not been proven to me that the ozone passes directly through all the tissues of the body.

Dr. Curtis: My reasons for believing that ozone passes into and through the body lies in the fact that where there is deep-seated congestion, such as in meningitis, pulmonary and hepatic inflammations, or in abdominal tumors, pain is felt in these parts when the electrode is placed over them, and it is not noticeable when these parts are normal. After several treatments and the inflammation has subsided, no pain is realized. Again, when the electrode is placed over the lungs the patient will taste the ozone in a few seconds, and after the usual treatment, which lasts about half an hour, the odor of ozone may be detected on the breath for some time, and it is especially noticeable on the skin where the electrode has been applied.

Dr. William Knight, Cincinnati: We all know the stubborn character of real neuralgia and that it shows a condition of the nerve which is not normal. Innumerable methods have been adopted in their time, and in special cases are of service to-day. The object of all methods is first to remove the local irritation and then correct the systemic predisposing condition. I would hesitate to believe that pain due to inflammation, to bacterial origin, or pain of a neuralgic character, is to be suddenly wafted away by something that is called ozone. But if we have a method which can

cure this terrible disease of neuralgia so readily it is a grand thing, and I would compliment any gentleman who has made such a discovery. Up to the present time the condition has often baffled the ingenuity, research and clinical observation of men in this country and abroad.

Dr. Curtis (in closing): It has been proved that ozonation will quickly alleviate pain, improve the circulation and reproduce nutrition and vitality. You will readily understand by this that it is equally effective in the treatment of many other diseases, and it is surprising to see how quickly a patient will recover. A patient who was recently treated for tuberculous meningitis was relieved of a severe toothache which had continued for two months (for which there was no apparent cause) after the second treatment. When the electrode was first applied to the head the pain was intense. This gradually subsided.

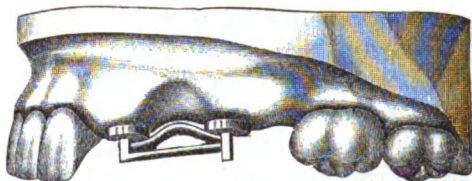
PARAFFIN SUBSTITUTION.—The latest marvel in surgery is the filling out of defective organs by the injection of a vaselin-paraffin compound under the skin. In this way noses that have been broken in, chins from which a portion of the jaw-bone has been removed, and similar features may be filled out. The bodily tissues invade the injected compound, and a hard body similar to cartilage is formed.

JAVANESE METHOD OF NARCOSIS.—L. Steiner describes in the *Arch. f. Schiffs- u. Tropen-Hygiene*, v. 12, a method of narcosis which has been long practiced in Java. The hands are placed on the neck of the subject, the fingers meeting at the back, and the carotid artery is briefly compressed with the thumbs, back of and a trifle below the lower jaw. The artery is pressed back toward the spine. Only 5 out of 30 subjects failed to respond to his application of this maneuver. The head falls back and the subject seems to be in a profound slumber, from which he awakes in a few minutes as if suddenly aroused. The effect can not be due to suggestion, as the same maneuver avoiding the arteries fails to produce any effect. The procedure is called by a Javanese term which signifies "compression of the sleep vessel." The popular name for the carotid artery in Russian, by the way, is also the "sleep artery;" and "carotid" is derived from the Greek *karos*, sleep. He has never witnessed or heard of any accidents from this method of narcosis, which is widely practiced on the island, frequently associated with general massage. The patients do not vomit, and there is no incontinence of urine or feces. He opened an inguinal abscess in one case while the patient was unconscious. He is inclined to advocate this absolutely harmless method of narcosis as worthy of a place in surgery, on account of the rapidity with which it can be accomplished and the rapid awakening. The procedure may also prove effective in combating cephalalgia, vertigo and insomnia.

Digests.

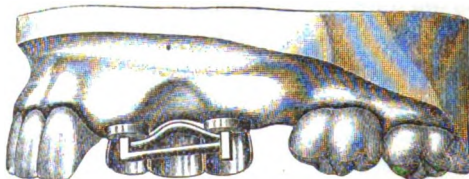
PORCELAIN BRIDGEWORK. By George W. Schwartz, D.D.S., Chicago. Presented at clinic of New York Odontological Society, January 21, 1902. In presenting this case of porcelain

FIG. 1.



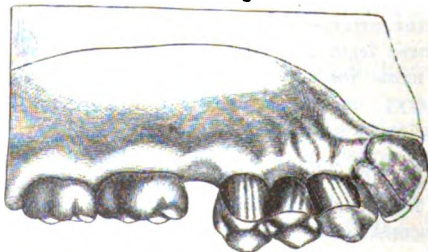
bridgework, my object is to show a recent improvement in a method I introduced to the profession some years ago. Originally I constructed the metal work as shown in Fig. 1. In a few cases where

FIG. 2.



the occlusion was very close some of the inner cusps were broken away by the force of mastication. To overcome this I began soldering backings to the metal work, as shown in Fig. 2. This is the

FIG. 3.



improvement, and I feel safe in recommending it to porcelain workers. This is a bridge without a saddle, and does not produce irritation at the interproximal spaces of the abutments.

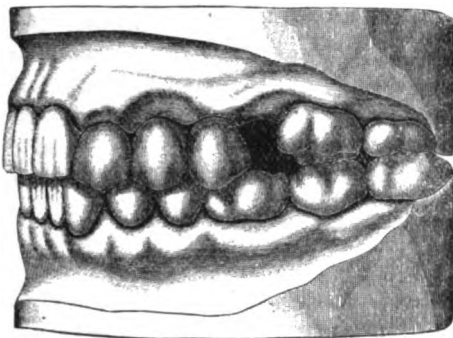
Brief Description of the Bridge.

The bands for the abutments are 29-gauge platinum plate.

The caps are 29-gauge iridio-platinum plate.

The posts are heavy square iridio-platinum wire.

FIG. 4.



The cross bars are heavy round iridio-platinum wire.

Twenty-five per cent platinum solder was used throughout.

The backings are 29-gauge platinum plate.—*Cosmos*, July, 1902.

ARTIFICIAL DENTURES, WITH SPECIAL RELATION TO THE IMPRESSION, TAKING THE BITE, AND ARTICULATION. By Rodrigues Ottolengui, M.D.S., New York. Read before the Northeastern Dental Association, October 30, 1901. Unlike some of the lower forms of animal life, man is not endowed with the ability, physically, to reproduce lost parts. His genius, however, has enabled him to mechanically produce substitutes which more or less restore him to normal comfort. Of these mechanical substitutes I know of none of which so much is expected as of artificial dentures. No other is supposed to fully perform all the functions of the original. Artificial eyes, ears or noses are merely cosmetic appendages restoring outward physical proportions. Artificial limbs, or parts of limbs, perform normal functions as well, but only in a very limited degree. With an artificial denture, on the contrary, the patient expects to eat, talk, taste, smile and look pretty—in short, to do everything that he has been able to accomplish with his natural teeth. It is a high tribute to the progress of dentistry, therefore, that we have among us so many masters of the art that it has

become a notorious and well-advertised fact that many so easily overcome the obstacles that they can afford to furnish full upper and under sets of teeth for about ten dollars—yea, and guarantee the result.

In spite of the existence everywhere of this superabundance of extreme skill, I believe there are yet a few problems which even the most skillful among us stand ready to discuss, and the object of this paper is to bring before you three of these problems.

Taking the Impression. We would perhaps all agree that a perfect impression is a *sine qua non*. Yet I ask the simple question, What is meant by a perfect impression? and discussion is at once opened. A perfect impression, and from such impression a perfect model of a mouth, in which all teeth are present, should be obtainable by all entitled to call themselves dentists. Yet we see few of them. But this belongs to orthodontia rather than to prosthodontia. The realm of the latter is entered, however, as soon as even one tooth is lost which we are called upon to supply. This will usually be the simplest task for the prosthodontist, the difficulty increasing with the number of teeth absent from the arch, until we come to the edentulous jaw. When you think of jaws in which are to be found a few teeth only, and these leaning toward each other as though seeking companionship in their increasing loneliness, you may be inclined to question my last statement. I am expressing only a personal opinion, and in a moment shall support the assertion with my reasons.

I use plaster of Paris for all classes of impressions with absolutely no exceptions. Where only a few teeth are absent, or where all have been lost, the impression tray is utilized. Often where but a few teeth remain it is best to dispense with a tray of any kind. In such cases the plaster is introduced with a silver-plated table knife and pressed and held in position with the fingers. This rule is peculiarly applicable in the lower jaw when the tongue is incorrigible. I have said that I use plaster exclusively. A good rule reads: "In proportion as it would be difficult to remove an impression, plaster of Paris becomes needful." Teeth which lean toward one another cannot be reproduced with anything but a material which fractures sharply, an attribute not possessed by modeling compound or wax. Where only a part of the whole number of teeth has been lost, the point to be observed in making a model is the perfection of the form of the teeth themselves. Accuracy in

relation to the soft parts will usually be attained without special effort.

This, however, is far from true in an edentulous mouth where we are dealing exclusively with soft tissue, or with soft tissues overlying hard tissues in differing proportions. Were the edentulous jaw equally hard throughout its entire extent of surface, the taking of an impression and making of an accurate model would be simple enough. We would but need to fill a tray with plaster mixed to a creamy consistence, apply it carefully and without pressure, and allow the plaster to set. The resulting impression would give an accurate model, from the standpoint of an anatomist. Often such a model will but lead the prosthodontist to failure, and a failure which too often he cannot comprehend. Why?

Speaking now of the upper jaw, the one requisite in a set of teeth more than all else demanded by the patient is that they should "stay up." Now it has been the sad experience of dentists that the mere fitting of a plate over an accurate reproduction of the surface of the maxilla does not invariably yield a plate that will stay in position. For this reason the prosthodontist resorts to various alterations in his models, some declaring a suction chamber to be necessary, while others loudly declaim against this course, but resort to relief chambers produced by the application of layers of metal over the harder parts of the mouth. Others favor scraping the heel or part of the model along which is to lie the back border of the plate. Still others produce raised lines, more especially in vulcanite work. I know of none who feels that he can rely upon merely fitting a plate over an anatomically accurate model.

If, then, alteration from the really accurate model is necessary, let us for a moment inquire as to the means of accomplishing this, and then ask ourselves whether anything can be gained in this direction by the method of taking the impression. The roof of the mouth being supplied with soft tissues of differing thickness, and adhering with different degrees of firmness to the underlying bones, experience has taught that a perfectly-fitting plate, because of the yielding of the softer parts, will finally rest and rock upon the harder tissues, thus producing movement which destroys the retentive quality, whether it be suction or adhesion. It happens that the harder places are usually along the central area, so that those opposed to suction chambers declare that alleged success with them is due to their acting as relief chambers, and that they are unneces-

sarily deep. If we admit this claim, we still find ourselves in a difficult situation. It is by no means a simple problem to so arrange the layers of relief metal that the plate, when completed, will press equally at all places. It is largely a matter of judgment and skill, and those who declaim loudest against suction chambers, having the skill to succeed without them, seem utterly unaware of the fact that they enjoy a dexterity possessed by few men.

Can we then at the time of taking the impression produce a model which will be more nearly the desideratum of the prosthetic worker than most of us do at present, and thus reduce the degree of skill needed to equalize the pressure of our plate after construction? I have within the past three years been applying myself to this problem, and I think the result has been sufficient to warrant my communicating it to my *confrères*. I have said that plaster of a creamy consistence will yield an anatomically accurate replica of the parts with which it is placed in contact without pressure. In a mouth where there is a considerable difference in the resistance of the soft tissues I have been taking impressions in the following manner: The plaster is sufficiently salted to insure quick setting. It is mixed comparatively thin, and stirred continuously in the cup until it noticeably begins to stiffen. It is then placed in the tray, and when quite stiff passed to the mouth. It is quickly carried to position, over the posterior parts first, and then pushed to place forcibly, force being directed upward and anteriorly. This force, together with the stiffness of the plaster, compresses the softer parts of the tissues of the vault—so much so, indeed, that a very trifling relief vacuum over the hardest places will give us a plate resting firmly in position. By this method some skill and rapid dexterity will be needed to obtain a good impression of the labial and buccal aspects of the ridge. If a combination gold plate with rubber attachment is to be made, this need receive no special attention, as the gold plate need not be brought forward farther over the ridge than will be shown in the impression, and a subsequent impression taken in the ordinary way with the gold plate in position will give the ridge over which the vulcanite is to rest. Where the plate is to be made of vulcanite, after pressing the impression tray to place, the left hand may firmly continue the upward forward pressure, while the fingers of right hand first force the plaster under lip, and then drawing lip over plaster exert pressure on the outside of lip, which will insure an impression of the ridge. Another method is as follows: Just

after transferring the plaster to the tray, quickly take up some plaster on the knife and smear it along the buccal and labial surfaces of the ridge. By this time the plaster in the tray will be firm enough for the class of impression here advocated.

Perhaps if I recite an extreme case it will be instructive. A gentleman applied to me for an upper denture on vulcanite, complaining that none that he had had enabled him to eat, nor would any of them "stay up." Examination showed that the slightest pressure anywhere along the ridge tipped the plate, this being especially true in the incisive region. The plate bore evidence of careful, conscientious workmanship. It had a suction chamber, properly placed, according to rule. Examination of the maxilla showed entire absorption of the bone in the intermaxillary region, the ridge though well defined being nothing but a mass of extremely soft tissue, readily moved into quite different positions. In taking this impression I used the knife, first placing a plentiful supply of plaster along the buccal and labial surfaces of the ridge. By this time the plaster in the tray was setting rapidly and was quite stiff. I placed the tray in the mouth, pushing it up at the back first and then forward and upward, exerting great pressure with both hands. The plaster in the tray of course united with that in the mouth, and the resulting model was accurate in all parts from the viewpoint of the prosthodontist. In the incisive region, however, the ridge was pushed forward abnormally, and this was carefully scraped off little by little, in order to retain the general shape, the scraping continuing until the labial outline conformed to the general curve of the other parts of the ridge. From this impression two models were made. Over one a plate was vulcanized having a suction chamber. On the other a single layer of heavy tinfoil was laid, extending over the entire surface of the harder parts. On the model so treated another vulcanite plate was made. Both of these plates, of course, carried no teeth. When tried in the mouth I could observe no advantage of one over the other. I therefore used the one having only the relief chamber, and mounted the teeth so that in the incisive region there should be no overbite of any consequence. With this plate the patient was enabled to incise and chew his food and the adhesion was good. I consider that the chief obstacle in this case was overcome by the means employed in taking the impression, the plate acting so as to exert such compression as to solidify the soft, I might even say flabby, tissues in the anterior region.

Taking the Bite. Next in importance to the model is the accuracy of what we call the bite. To a lay mind this would seem a simple procedure, yet the dentist is rare who has any degree of confidence in his own skill in this procedure, and dentists are not especially lacking in self-appreciation. The proof is to be found in the fact that it is common practice to try in the teeth. I think that every time a dentist tries in a set of teeth, after mounting and prior to completion, he tacitly admits that he doubts the accuracy of his bite. I remember that one gentleman replied to this assertion of mine by stating that he tries in a set to be sure of his cosmetic effects, but when I asked him, "Do you never find it necessary to alter the position of the teeth because of faulty occlusion?" he laughed and turned away. I will admit that in a few instances it may be wise to see the teeth in the mouth in order to be sure that the arrangement will suit the physiognomy, but that is not the kind of trying in to which I allude when I say that the man who tries in all sets of teeth before finishing them has no faith in the accuracy of his bite.

What engenders this almost universal lack of faith in one's own skill? If we discuss but a few moments the action of the patient, compared with the dentist's methods, I think the mystery will pass. The action of the mandible is not a mere up-and-down motion from fixed hinges, the movement being in a fixed arc; on the contrary, the mandible describes a more or less complex movement, including forward and lateral motion. The two important acts of the mandible bearing relation to the taking of the bite are, first, the more or less involuntary act of simple closure of the mouth, when commonly the mandible will assume its most posterior pose; second, the always voluntary movement which accomplishes incision, and which brings the mandible into a forward pose. It is so true that this is the voluntary closure, that almost all persons who close the mouth upon request bring the mandible forward. This is as true of those who have teeth as of those who have none. If the mere request of a patient "to close the mouth" results in this conscious forward movement of the mandible, how much more true will it be that he will assume the forward pose if asked to bite through wax or other material? He is thus told to incise something, and naturally the mandible assumes the incising action. How then is the bite to be obtained with certainty that the mandible will be in the involuntary rather than in the voluntary pose?

If a gold plate is to be made, of course it is used as the basis in taking the bite. In vulcanite work I like to make the plate first, and attach the teeth subsequently, in which case it can be used in the same manner as the gold. But any base plate can be used on which to build up a biting surface with modeling compound, or the compound may be used alone. In any event a ridge of modeling compound is built upon the base plate, and chilled with cold water. It is then carried to the mouth, and a sharp knife is used for trimming away all surfaces until a neatly formed plate and ridge are produced, which can be placed in the mouth without distorting the lips or cheeks. The comfort of the muscles will render the patient much more tractable. The biting surface is next trimmed away bit by bit until every tooth of the opposing jaw touches the surface of the modeling compound at the same time, the length or opening of the bite being as desired. It will be observed that now, while all the teeth touch the modeling compound, there is no incision—that is, the patient bites nothing. It will therefore not be difficult to have him bite with the mandible properly posed. This accomplished, the modeling compound is to be marked with a sharp instrument along the labial surfaces of the opposing incisors where they come in contact. This will be a guide to accuracy. Next a very thin film of wax is melted upon the modeling compound in the molar and bicuspid region on one side only. Thus the first act of actual biting is through a very thin layer of material, and being at the back of the mouth there is little effort to move the mandible forward. At any rate the mark on the compound in the incisive region will be a guide to determine the matter. This step will produce but a mere imprint of the cusps of the molars and bicuspid on that side, and is next repeated for the opposite side. Then by slow stages more and more wax is added in these posterior regions until a perfect imprint of the occluding surfaces of all the molars and bicuspid shall have been obtained, all the while nothing having been placed in the incisive region for the patient to bite into.

From this point the procedure varies. The best method is to take an impression of the opposite jaw and set the model into the imprints on the bite, and thus arrange the bite in the articulator. If the dentist does not wish to do this, soft wax may next be placed in the incisive region, the imprints in the posterior regions now acting to guide the jaws, which are closed slowly. Even now

we have nothing but the imprints of the occlusal surfaces of the teeth. The jaws are kept close and wax is molded around the buccal and labial surfaces and pressed tightly to the modeling compound. The whole is then chilled with a jet of cold water and removed carefully. The bite when poured will give an accurate view of the opposing teeth except at the palatal aspects, but provided the imprints of the occlusal surfaces are deep enough for articulation, this will be an advantage rather than otherwise, as the plaster teeth will be stronger for the support at that side. In extreme cases, where even the film of wax disturbs the act of the patient in biting, plaster of Paris may be used instead of wax for the molar and bicuspid imprints. Then a model of the opposing jaw must be obtained.

The above directions are, of course, for patients who have teeth in at least one jaw. Where all the teeth are missing I know of nothing requiring more skill than to construct sets of teeth for both jaws which shall occlude properly. The best method is to prepare a base plate and biting plane for the upper jaw, trimming to approximately proper length of the teeth to be set. Then prepare a similar one for the lower jaw, wax the two together, place in the articulator, set up the teeth of lower jaw and make the lower set. Then proceed with the upper as though the lower were natural teeth. There are other reasons why the lower set should be completed first, rather than to attempt to set up two sets coincidently; but this will be considered when discussing articulation.

Articulation. I think I recall the very first paper which Dr. Bonwill read in enunciation of his philosophy of articulation. I recall that the men in the room were terribly bored, and that many left before the reading was over. The paper was unconscionably long, and for that reason was not published at the time. It has taken nearly twenty years to awaken any great interest in this subject, but to-day there are signs which indicate that the old methods of setting up teeth are to pass, and, practically, the Bonwill method to have sway.

The old articulator allows for nothing except a simple hinge action, and teeth set with such an appliance, even though they articulate as do the teeth of engaging cog-wheels, cannot be expected to be serviceable in mastication. If those who have never used one of the two anatomical articulators, the Bonwill or the Gritman, would obtain one and set up a full upper and under denture, using the new as they have the old articulators, that is to say, utilizing the hinge action

only, a very instructive lesson might be learned. Both sets having been articulated according to the old methods, let the experimenter move the lower set to one side as far as the articulator will permit, and he will immediately discover why so many complaints have reached him in regard both to faulty mastication and to lack of stability. More than probably he will find that in closing with this lateral action at its extreme, the cuspids will be the only two teeth in antagonism, which fact would easily explain a tipping of one or both dentures. Let him then begin grinding, tooth by tooth, with small stones until he obtains good occlusion during all motions of the jaw, and in the end I venture to say that from this single experiment with an anatomical articulator he will have learned more than from all his previous experiences with patients.

I recommend that, when constructing a full denture, the lower should be made first, because it greatly facilitates the grinding necessary to perfect the occlusion, if the teeth of the lower set are so fixed that they can be ground without removal from the articulator. It is the lower jaw which moves, and for this reason, and because the overbite is in the upper jaw, the lower set will require the most grinding.

There is practically no set of teeth made by any manufacturer which can be properly occluded without considerable grinding, and this brings me to an intensely interesting fact. Let any one carefully occlude a full upper and lower denture on a Bonwill or Gritman articulator, and when completed he will discover that their appearance is twenty-fold more natural than any work he has ever before done. It is not often that patients require teeth at an age when their own organs would have been of normal dimensions; therefore it is not strange to find that almost invariably in perfecting the occlusion the cusps of the cuspids must be materially shortened. The incising edges of the incisors will all need grinding. The inner cusps of the upper first bicuspid and the buccal cusps of the lower will likewise need shortening. The other changes are mainly to be made in accordance with the requirements of the case in hand. Here I may mention another advantage in vulcanite work, of vulcanizing the plate first without teeth. By this means the entire work of grinding for occlusion need not be done when setting up the teeth. The greater portion, of course, should be done to avoid error. Having the vulcanite plate already made, the central incisors may be waxed to it, and then lateral motion of the articulator made. This will indicate

just how the cusps of the upper and lower centrals must be ground so as to properly occlude during all movements. The upper centrals are then firmly attached with hard wax. The laterals are next added and ground to occlusion in same manner, and so on throughout the arch. Some slight discrepancies may be observable, but the teeth may be attached to the base by a second vulcanization, after which the set may be returned to the articulator, as it is not necessary to remove or destroy the plaster cast. Thus we have both sets on the articulator in their original positions, and with small stones the grinding for occlusion may be brought to final perfection.

One word about articulation in relation to stability. I think many sets fail because the dentist endeavors to make his patient look young again. Not only is a person's age no disgrace, but in regard to teeth their falsity will be only the more apparent as the result of any effort toward rejuvenating effects. In an edentulous mouth there is little doubt that the arches are smaller than when supporting the natural organs. If the artificial substitutes be made to imitate the original arches, the teeth necessarily must be set outside the ridge, and this produces a leverage which largely accounts for the tipping of many plates. Set the teeth as directly over the underlying ridge as possible, even if you must depart somewhat from the ideal. By this means the plate will be more satisfactory because of greater stability in conversation and mastication. Moreover, a patient will be more comfortable than with teeth set on a larger arch.—*Cosmos, May, 1902.*

PERFECT FITTING DENTAL CLASP. By G. W. Pitts, D.D.S., Chicago. The practice of constructing dental clasps is one which has been in use for a long time, and one which has caused no end of trouble to both patient and operator, and eventually the loss of a great many teeth which in the beginning seemed too good to sacrifice and crown. This is due to ill-fitting clasps constructed according to the method generally in use to-day. There is, however, a clasp recommended by the late Dr. Bonwill which should be more generally used, and would to a great extent do away with the denuding or wearing away of tooth surfaces by the upward and downward excursions of the clasp upon the tooth. The clasp referred to is the one with the lug extending over the occlusal surface, which prevents to a degree these movements.

There are, however, other things which are to be taken into con-

sideration as reasons why we should not too freely use clasps to retain partial dentures, viz.: That it is impossible to make a clasp either by forming it to zinc or metal dies which will be of sufficient strength to accomplish the result desired, and accurately fit all surfaces of its retainer. The difficulty encountered is that a clasp metal of over twenty-six gauge is so stiff and rigid that it is worked with the greatest difficulty, and when finished is usually very unsatisfactory in adaptation, and also that a clasp made of twenty-six gauge standard clasp metal is not of sufficient strength to make a clasp which will stand the force applied to it, and keep its shape and position.

A clasp which will fit accurately and give sufficient strength under all circumstances may be constructed by the following method: First, take an impression of the tooth for which you intend to construct clasp. Treat in usual way, and fill with investment compound for model. By adding a little whiting or prepared chalk to investment, one can acquire a great deal smoother model, a thing which is much desired at this point. About the tooth form burnish a very thin piece of platinum about the shape you intend to have clasp when completed, leaving it flush and extending well into the sulci. Wax securely, and fit approximately over it clasp metal thirty gauge. When it fits to your satisfaction run melted wax between platinum and clasp metal, allow to cool, and invest model platinum matrix and clasp metal. When investment has hardened, remove wax with hot water and heat case until all moisture has evaporated. To complete, flow twenty carat solder between platinum and clasp metal. Finish in the usual way.—*Review, June, 1902.*

LOCALIZED AND REFLEX APICAL PERICEMENTITIS DUE TO SEPTIC INFECTION OF A PULP. By Otto E. Inglis, D.D.S., Philadelphia. In a previous article the writer mentioned a case in which arterial hyperemia of the pulp of a right upper bicuspid attended by the usual response to thermal changes was due to the inflammation of the pulp of a right upper third molar. The pulp of the third molar was found partly dead, and the devitalization of the canal filaments relieved the condition in the pulp of the bicuspid.

In a case recently presented a young lady related that the right lower first molar had been crowned two years before, and up to within two weeks had been comfortable. Trouble seemed to imme-

diately follow the filling by her former dentist of a large mesio-occlusal cavity in the right lower second molar with amalgam. Both the first and second molar simultaneously became more and more sore until the annoyance was constant and mastication upon the right side unbearable. The response to both intense heat and cold was delayed in both teeth. The tenderness upon percussion was about the same in each tooth, and the third molar and second bicuspid were each somewhat irritated pericementally. Differentiation seeming impossible, a drill and bur were used to perforate the amalgam filling and to expose the dentin in the neighborhood of the pulp horn of the second molar. Some slight sensitivity was noted and the drilling stopped and the patient closely questioned. As she averred a knowledge of a new sensation, ethyl chlorid was again tried and a response more pronounced than at first obtained. As this seemed to exclude the second molar, the gold crown was removed from the first molar and the discovery made that the cement which secured it to the tooth was in direct contact with dentin which should overlie the pulp horn. Thermal test produced a somewhat delayed response. The location of the horn was explored with a drill, which entered the pulp cavity without pain or particular evidence of pus. The condition was apparently that of a decomposed or gangrenous pulp mass. Exploration of the canals discovered vitality in each of the pulp filaments at locations corresponding to the entrance of the canals. The pulp cavity was slightly enlarged and syringed out. A thread of cotton saturated with phenol-camphor, to which menthol had been added, was loosely placed against the vital remnants of the pulp with a view to their sedation and sterilization. This was covered with cotton and sandarac. The opening in the amalgam filling in the second molar was now refilled and the case dismissed. After a short time (not over an hour) all tenderness had disappeared from both molars, which could be freely tapped after twenty-four hours. Arsenic was now applied to the first molar pulp filaments.

This case seems to have differed from the first described in that the reflex hyperemia was produced in the pericementum instead of the pulp, while the causes in the two cases were as nearly alike in character and extent as one could judge from a clinical experience with them.

Such cases seem to prove beyond all peradventure that the dental pulp is capable of producing a reflex hyperemia in the pulps of other

teeth and in the pericementum of its own tooth and of another tooth. This being the case, the reference of apical pericementitis following arsenical applications to the arsenic, and of that following death of the pulp from abscess or confinement of gases during suppuration of the pulp to direct action of microorganisms upon the apical tissues must be regarded as at least possibly erroneous. In the case of the arsenical application a slight apical pericementitis often follows the application, but subsides upon treatment purely external to the tooth and without removal of the arsenic. Again, it is noted that in suppuration of the pulp such irritation as follows the stasis in the pulp has a tendency to subside, even when untreated. The writer argues that in both cases the condition is as purely a reflex as is the establishment of arterial hyperemia of the pulp with its concomitant symptoms as the result of hyperemia of the apical tissues produced by a blow of moderate severity.—*Stomatologist*.

PACKING AMALGAM IN CAVITIES IN THE BUCCAL SURFACE. By E. K. Wedelstaedt, D.D.S., St. Paul. Let us take a practical case. Suppose we have a cavity in the buccal surface of a lower right second molar, which involves the gingival three-fifths of the crown. The rubber dam has been adjusted prior to the preparation. The cavity is ready for the filling material. For various reasons it is decided to use a quick-setting amalgam. Before mixing the alloy with mercury the amalgam pluggers should be taken from their place and fitted to the cavity. The largest plugger that will conveniently enter the cavity should be selected as the instrument with which to pack the amalgam. Now mix the alloy with mercury. Knead it thoroughly, and when it is in workable condition place the largest mass that can be advantageously handled into the cavity and compress it, using considerable force while so doing. This first mass of amalgam should, after being compressed, fill the cavity about one-third. Add another large mass of amalgam and compress it. Continue adding amalgam and compressing it with about all the strength possible until the cavity is overfull. Should the cavity be about three millimeters gingivo-occlusally by five millimeters mesio-distally, take an amalgam plugger six millimeters in diameter and send the entire mass of amalgam home. Do not be afraid to use all the force you can exert. Then let the filling alone until it has fully hardened. Do not use a burnisher to "pat it down," for as the burnisher is drawn across

the amalgam from distal to mesial the amalgam creeps from the distal cavity margin. If a burnisher must be used, burnish toward the distal margin, beginning on the amalgam some distance from that margin. Then place an instrument on that portion of the amalgam burnished to hold it in place while the burnisher is being used on other portions of the amalgam. It is better, however, not to use a burnisher. Not more than two or three minutes should elapse after the final condensation before the amalgam should be hard. (The majority of quick-setting amalgams take too long a time to set. There should be an extra quick-setting amalgam, say one that would set in three minutes after being mixed. A number of practitioners need such an article.) As soon as the amalgam is hard it should be dressed and trimmed, using the Black trimmers and knives. Trim the amalgam from the center toward the margin. It is seldom or never necessary to trim from the margin toward the center. The more perfect the trimming at this time the less work remains to be done when the final polish is given the filling.

Now just one word regarding the finishing of fillings. It is just as essential that an amalgam filling should be trimmed and polished as it is that the cavity in the tooth should be filled. From the number of unfinished fillings I see I cannot help saying that there are too many men who charge simply for making the filling. They seem to forget that more work and skill are required to properly finish a filling than are necessary in preparing the cavity and making the filling. Altogether too little attention is given this subject of finishing fillings.

After an alloy has been mixed with mercury, been well kneaded and is ready for the cavity, the great majority of practitioners believe that how it is placed in that cavity makes little difference. This is a mistake that leads directly to failure, for compressing the amalgam and the use of instruments are both factors that must receive most careful consideration, provided we desire to get the best results from the use of amalgam.

To prove the correctness of what has just been stated, I took a quantity of a well-known alloy and mixed it with mercury. After it was ready for use, I made a series of fillings. In making these fillings a number of different methods of compressing the amalgam were used and different methods of instrumentation tried. A careful record was kept of each of the series made, and a week later they were tested in the dynamometer. After testing these different

fillings I tabulated the results and could scarcely believe what was before me, for some of the fillings crushed when 15 pounds were placed on them, and others would not crush under 1,000 pounds of pressure. (All the fillings were the same size.) Now when it is taken into consideration that all these fillings were made from the same mass of amalgam, we can begin to realize the effect compression and instrumentation have on the final results. The experiment I have just spoken of was not made once or twice, but I took this same alloy and used up the entire ounce in making a dozen or more experiments of the same nature. The only reward I obtained for all my labor was a verification of the first results obtained.

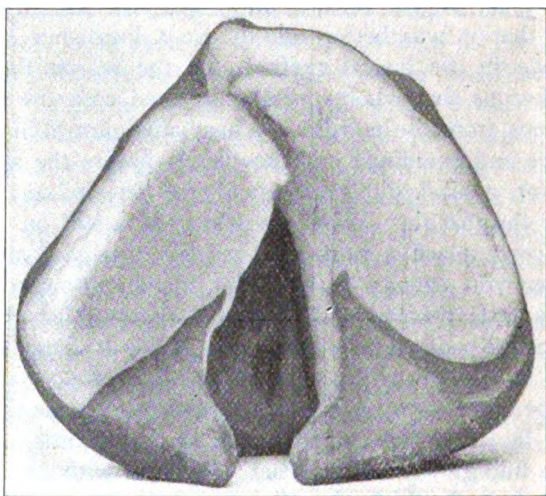
I stated that it was better not to use a burnisher on amalgam fillings made in the buccal surface, for the reason that amalgam is so treacherous that where pressure is used with the burnisher it readily creeps from the margin. Where amalgam fillings are made in test tubes and examined microscopically before the amalgam has started to set, a black ditch can usually be detected at one or more places near the margin. While the test tube is still on the stage of the microscope, place a burnisher on the amalgam and note the results when you attempt to coax the amalgam toward that black ditch. If a little force is used you will observe that the amalgam on the opposite side of the tube springs away from the margin. Practically the only way to spread the amalgam so that the black ditch will be closed is by using the burnisher with the lightest force possible or by using two burnishers at the same time, one on each side of the filling. Where cavities are filled with amalgam, after being packed, it should be let alone until fully set, for burnishing merely invites failure.

If amalgam must be used in a cavity, remember that the best results are obtained when attention is given to proper amalgamation, strongly compressing the amalgam, and to instrumentation. If there is an unwillingness on the part of the operator to follow certain well-known rules for using amalgam, some other filling material had better be placed in that cavity.—*Summary, May, 1902.*

CLEFT PALATE CASE. By Carl B. Miller, D.D.S., Cedar Falls, Iowa. Read before the Iowa State Dental Society, May 21, 1901. It is a sense of duty, as well as of pleasure, which prompts me in reporting this case. It differs from most cases of its kind in that the upper jaw was cleared of all teeth, thus making it necessary

to insert a full upper denture, as well as a palatal mechanism, the cleft in the case extending through both the soft and hard palates.

The patient, of Danish nationality and twenty-three years of age, presented herself to me July 31 of last year and wanted her upper teeth removed with the expressed wish of having a plate. Upon questioning her I found that while she knew her speech was defective, she did not know that her mouth was any different from that of anyone else, or at least that her defective speech was the result of having a condition so abnormal. Her desire was for new teeth,



thinking nothing of the betterment of her speech, or that such a thing was possible. Her teeth were nearly all decayed away, and what few remained were lying in all directions, especially in the front of the mouth, due to the fissure of the cleft at this point. These I removed at this time. Dr. Ottolengui says, "No matter how valuable teeth may be to ordinary persons, they are doubly so to the cleft-palate patient, who must depend upon them not alone for mastication, but also for speech, since they serve to retain the instrument which enables him to overcome his infirmity." My patient's teeth were too far gone to be of service in such capacity, and besides, owing to the fact that she only thought of or cared about teeth, they would very likely not be needed to hold an appliance in place. So

that the first thing to be done was to construct a plate and to make something to fit the opening if possible.

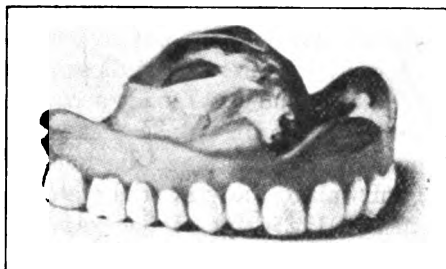
January 8 of this year I took the impression as follows: I selected a tray suitable for the case as for an impression of a mouth under ordinary conditions. I mixed a small quantity of plaster pretty thick and carried it with a spatula up into the opening or cleft, beginning to fill in the front or narrowest portion, bridging over and back, and covering the upper sides of the uvula. This formed the dome or completed the roof of her mouth. After it had set sufficiently, I coated the plaster with oil, and then filling the tray carried it into the mouth in the usual manner. Of course, in removing the portion placed up in the fissure remained; this I moved backward with pliers, and when removed put it in place on the impression, and made my cast. The taking of the impression in this case was the most difficult as well as the most important part of the operation, the divided uvula and the adjacent soft tissues being so easily moved that a correct impression of those parts was very hard to secure. However, from the cast I made a wax trial plate, and at the same time formed a piece of wax so that it filled or closed the opening and extended back and above the uvula on each side. I fastened this piece of wax to the wax trial plate and tried it in the mouth. Here I altered the shape of the wax to properly fit the opening, and at the same time made corresponding changes in the cast.

Up to this time I had in mind either to make a soft rubber velum or an obturator. Arguments in favor of each were considered. The fact that an obturator has proved very satisfactory in such cases, and the conditions in this case being such that a rubber plate was to be made, led me to the idea of making a plate with a simple extension to fill the opening. This extension would necessarily be in the form of an obturator, but different from the obturators made or suggested by Dr. Ottolengui, in that it would be of solid rubber instead of hollow.

Dr. Ottolengui says: "An obturator is an instrument designed to merely fill a gap or close an opening in the palate. To be of any service the instrument must be so constructed that it accomplishes all that the artificial velum does, even though in an entirely different manner. It must accurately fill the cleft when the parts are at rest. It must also fill the fissure whenever, and no matter how far, the movable sides of the cleft are drawn upward. To serve such a

purpose the obturator must be so thick that when the sides of the palate are drawn upward to their greatest limit they still rest against the sides of the obturator." "An obturator, unlike an artificial velum, is stationary in its position, but is of such form that the pharyngeal muscles of the throat in the movements incidental to the production of articulate sounds hug the obturator and so separate the cavity of the nose from the cavity of the mouth." "An obturator hinged to the plate does not add to its usefulness."

Having decided to make the plate with an extension to fill the opening, I first filled the opening in the model with plaster, so that the finished plate would in the hard palate portion simply extend into the opening enough to lap the border and gain any advantage



there might be in the lap to help secure the plate in place. Beginning with the soft palate, I made this extension, which I shall call an obturator, to extend farther into the opening, and wider, so that when the parts were at rest the two points of the divided uvula lay under and against the obturator. After filling in the cast here and trimming off there until its shape would produce something that would fit the case, I had little difficulty in setting up the teeth, waxing up the case, trying it in the mouth, and finally investing and vulcanizing; though the flasks were none too large to accommodate such work. A point to be observed is, that what has been done was done easily and required nothing but what we use in our everyday practice.

I had hoped to have the patient here so that we might see what has been accomplished, but I could not prevail upon her to come. The cast will show with what I had to do. Owing to the flaring of the process on each side, and the large maxillary tuberosities, it was

not easy to carry the plate to place, but with a little work it was successfully inserted. I advised the patient as to what she might expect and instructed her to return in a few days. At first she was troubled by food stopping against the plate or roof of her mouth in trying to swallow, but she soon adjusted herself to that, and has never had to have anything done to the plate since it was put in place. Her speech is very much better, as she says she can make herself understood easily now, whereas before she had great difficulty in making her wants known. It takes time for the patient to learn to talk with the appliance, as would be the case with any, for having always had such a deformity it is like learning to talk all over again. The treatment of the case could not be more simple, and yet the results are most gratifying, and I doubt very much whether something more elaborate would prove as satisfactory. The removal of the teeth and the construction of a lower plate to articulate with the upper will soon be undertaken, when she will have a condition which, while not equal to what nature usually does, will be an improvement over what nature did for her.—*Cosmos*, June, 1902.

SHELL CROWN WITH A PORCELAIN FACING. By F. Stauber, D.D.S., Brooklyn. Every practitioner is familiar with the object of a shell crown, which is to inclose and thoroughly protect any remaining portion of the crown and neck of a tooth. Personally I am very much in favor of thus preserving teeth which are beyond filling. Many patients do not care to have a full gold crown inserted on a first or second bicuspid tooth, and in those cases the porcelain facing can be employed.

There are many ways to construct a porcelain-faced crown, and I avail myself of the opportunity to report one way which I have recently tried for the first time and with remarkably good result. The tooth in question was the first upper bicuspid. After devitalizing the pulp and extirpating it, I found two very small and tortuous canals, and concluded not to enlarge them for the retention of platinum pins, but to make the crown without them. To give it an equally good and strong support I ground the tooth down just one way, which is, so to say, the main feature of the work. The root-canals were filled with oxyphosphate cement. Upon a subsequent sitting I prepared the tooth for the crown. The buccal cusp was very frail and the palatine cusp good and sound. I first ground

the masticating surface down flat in order to completely clear the occlusion from below. After separating between the teeth with a hard rubber disk, and giving the tooth a conical shape, I cut down the buccal surface to the gum margin, the same as for a Richmond crown, leaving the palatine cusp, however, as on this I depended for the main support of the crown. I then made a telescope cap of twenty-two-carat gold plate, 30 gauge, soldering it with twenty-carat gold solder, to exactly fit the tooth as it was ground down, and letting it run about one-sixteenth of an inch under the gum. Next I took the color of the teeth and the bite, and then the impression with the crown in place.

The models having been properly articulated, I backed a suitable tooth with pure gold, 32 gauge, and ground its cervical end to the proper position on the front bevel of the cap, obtaining a flush joint. This done, the exact articulation ascertained, and the tooth attached to the cap with a little sticky wax, I struck up a bicuspid cusp of twenty-two-carat gold plate and fitted it to the surface of the porcelain facing, at the same time occluding it with the lower teeth, and waxing it into position. The model was then taken off the articulator, cut down to a convenient size, and the crown invested as one would a piece of bridgework. After the wax was boiled out and the case heated for about an hour, I united the parts at the back with eighteen-carat gold solder. The crown was finished and polished like any ordinary piece of work of that kind, and fastened to the tooth with oxyphosphate cement.—*Brief, May, 1902.*

SWALLOWING.—Schreiber decides that the act of swallowing into the pharynx, barring accidental factors, is executed: First, by contraction of the mylohyoid and hyoglossus, directly followed by contraction of the geniohyoid and thyroid, the latter following so closely upon the former that it is doubtful whether the first is really the chief act in the process of swallowing; directly after this, the esophagus opens, and the mylohyoid and pharyngeal constrictors force the mass into the esophagus. It is not determined whether this is done chiefly by the mylohyoid or by the constrictors but it is more probable that it is mainly done by the latter. There is at the same time an increase in pressure in the esophagus, which forces the contents on; and there is actual contraction of the esophagus itself. But Schreiber believes it is probable that the negative pressure in the thorax is of much importance in carrying fluids and gases, at any rate, through the esophagus. There are, then, two forms of peristalsis following this: A rapid form, in the cervical portion; a slower one, in the thoracic portion.—*Arch. f. Ex. Path. u. Phar., Phila. Med. Jour.*

Letters.**WARNING.**

New York, July 19, 1902.

To the Editor of the DIGEST.

MR. EDITOR:—We are informed by one of our representatives that a person calling himself Dr. L. W. Comstock of Columbus, Ind., is traveling among dentists and offering to sell them for \$25 a formula consisting of cocain and ether. Our representative's informant purchased the formula for \$17.50. It might be of advantage to readers of your journal were you to inform them of this imposition.

Very respectfully,

McKESSON & ROBBINS.

**AUTHORSHIP OF THE PAPAIN METHOD—REPLY BY
DR. CASSIDY.**

Covington, Ky., Aug. 9, 1902.

To the Editor of the DIGEST.

DEAR DOCTOR:—In reply to Dr. Latham's letter in the July DIGEST, I would say that if she will read again my paper in the June issue of the DIGEST she will realize that Dr. Van Antwerp was given full credit for discovering the digestive power of the paw paw, and that pulp digestion per se was not involved. Her surprise in the July number is surprising indeed.

Yours truly,

J. S. CASSIDY.

**REPUDIATES THE GERMAN - AMERICAN DENTAL
COLLEGE.**

Chicago, August 21, 1902.

Dr. J. N. Crouse, Editor Dental Digest.

DEAR SIR:—I hand you this letter for publication in your journal. I am through with all controversy with the State Board; in fact, I ought never to have had any. My troubles began when I was lured into becoming a student at the German-American Dental College. When I came to Chicago late in 1900 I was a stranger in America and a stranger to American institutions. I had letters of introduction to reputable schools, but thinking that it would be best for me to matriculate at the German-American College, I did so.

I was influenced to enter this College because of my inability at

that time to readily comprehend and speak the English language and also by reason of the catalogues and announcements of the College which came into my possession and attracted my attention while I was in Europe. The statement was made in the college literature circulated all over Europe that it was a reputable institution and that its diplomas were of equal value with those of any reputable dental college.

I had no information to the contrary until some time after I had matriculated and become a student of the College. I had not been there long before I began to see many things I did not like, but I kept along until the College graduated me in April, 1902, being assured all the time by Dr. Huxmann that everything was all right and that I would get a license on my diploma to practice dentistry in Illinois. I presented my diploma first to Dr. Reid, the Secretary and then to the State Board, and was refused a license by both. The remainder of the story is told in the mandamus proceedings just decided by His Honor, Judge Chetlain.

While I was a student in this College, and when I filed my petition for mandamus against the State Board, I knew nothing of the ugly facts in the possession of the State Board and disclosed on the hearing, which were so decisive of my case and the fate of the German-American Dental College. I do not see how the court could have decided differently from what it did; I am fully satisfied with the justice of that decision, and from it I shall take no appeal, for I think that it deserves to be considered final and as marking the end of the existence of the German-American Dental College.

I filed my petition in good faith, and had the aid of able counsel, but no counsel could cover up Prof. Huxmann's many frauds, which constantly came out in the evidence against him and his college. I am only one of many victims of the German-American Dental College, Dean Huxmann, and its so-called "faculty."

There seems to be nothing for me to do now except to join with Dr. Frida Mueller and compel the College and its dean to make restitution to me of what they have obtained by fraud. Accordingly, I have retained John W. E. Wayman, Esq., of No. 813 Association Building, Chicago, as my counsel and attorney to prosecute them and get my money back, and I would advise all other victims to do likewise. I have the honor to be,

Very truly yours,

ETIENNE STUMPF.

THE BOSS'S DREAM.

(As Told By the Office Boy.)

Sometimes after the Boss has had too mutch Pie er somethin' fer Dinner, he'll lay down on a Lounge in the back room, an' Sleep it Off, ef business ain't too Rushin'. Yesterday he done that, an' when he come in the Offis later, says he, "James, I've had a mos' Delightful Dream. I thought I'd moved my Offis in a new Sky-Scraper they'd built somewhere, an' it seemed like I'd got rid of all my old, Pestiferous Patients, an' I'd got a Entirely New set, all Ritch Folks, like the Chicago dentists all has. I dreamt I had mos' Magnificent rooms, high up, an' a Offul Purty young lady with white satin Slippers, an' a Bokay of American Beauty Roses stuck in her Belt, to 'tend Door. She had a silver Platter in her Hand, an' when anyone would come in, she'd hold it out, an' they'd drop a Ten Doler gold piece in. Then she'd say, 'The Doctor is Terrible Drove today, an' Blamed ef I know whether he kin see you,' an' she'd refer the Caller to another still more Beautiful Young Lady, settin' at my Offis Door, an' she'd say she'd Inquire. So she'd come out to the Labor'tory, where I'd be a-smokin' a Henry Clay Segar, an' she'd Fuss Round a minute, an' then she'd Go Back an' say to the Man I said he might have a Appointment, later on, when I wasn't so Busy. Then she'd fix it fer about nine weeks ahead, an' the man would say, 'I'm Offul Obliged,' an' he'd go away, holdin' his jaw."

Jis' then I interrupted the Boss. Says I, "How Mutch a Weak did you pay them Young Ladies?" The Boss he kind o' got Rattled a Minute, but he had his Nerve with him, an' he said, "W'y James, I'm astonished at you! I—I—didn't Haf to pay them Nothin'. They wasn't the Kind that thinks so Offul Mutch about money. But as I was a-saying'; my Patients was all Ritch Folks, that jis' Waded in Money, an' they'd drive up in their Carriages, an' my Offis Girl she'd let 'em Come In, an' when they'd got Past the other Girl, to where I was, they'd say, reel respec'ful, 'Doctor, if you're at Leisure, would you mind puttin' somethin' in a Achin' Tooth fer me?' An' when I'd done it they'd say, 'How Mutch is it please?' an' I'd say, hesitatin', like it wasn't only a Trifle, an' I was reely most Ashamed to charge anything. 'Oh call it Fifty Dolars, Madame!' An' the Lady she'd say, 'Why is *that* all!' an' she'd take out **her Purse** an' Pay, an' say, 'Thank you ever so Much, Doctor.' Then she'd go Right Out, never even stoppin' to tell me how her Gran'father had

a Tooth ache all the Week, once, an' his Face it swelled Up so Off Big he was Frightful to See, an' all of a Sudden the Tooth it Bust right in his Mouth, mighty nigh wrecking the Premises."

"But I was a-tellin' about my new Offis, James. There was one them Revolvin' Fountain Spittoons, lookin' like a Cake Basket, a mine was all Gold-Plated, an' had a stream of Cologne Water runnin' all the time. The Chair worked by Electricity, an' had Music-Box in the Seat. In fact, James, the whole Offis was so fine I thought I was in Heaven, at first. But the Patients was what Got Me. Nice little Girls would come a-skippin' into the Operatin' Room, an' they wouldn't point to the Ingein an' say they Hated the Buzzin'-Machine, nor they wouldn't say nothin' about how I must stop if it begun to Hurt, nor nothin', James, that would offend the most Sensitive Dentist. On the contrary, they'd say they jis' loved to have Teeth Filled, an' they'd stayed away from the Matinee purpose to come to the Dentist. An' if I'd keep them waitin' too long I'd heer them a-cryin' 'cause I didn't hurry up. Then when they Set Down in my Chair, they'd open their mouths Reel Wide, an' they wouldn't want to know what nothin' they seen on the Operatin' Tray was for, or would it Hurt, or nothin'. All the time they'd be smellin' so nice of Sachet Powder, an' when I got done they'd tell me they liked me Lots Better than they did their Sunday-School teacher. Then the nex' day in the early Mornin', I'd git a scented note from the little girl's mother, an' she'd say how perfectly delightful the afternoon had been to little Gwendoline, an' wouldn't I please telephone right away, an' let her an' Mr. Multimillion her husband know, if Mrs. Contour an' me couldn't join them at Bar Harbor the coming summer, an' spend at least a Month or two at their Cottage."

"It was Immense, James, an' I felt like I could reely love Dentistry. You know, James, they's been times when I've said I wisht I'd 'a' been a Carpenter, er most anything but a Dentist. Fer the Reason that People doesn't seem to Appreciate Dentists like they does Dress Makers an' Milliners, James. But I wisht you could 'a' been the Dentist in my new Office, an' could of seen what Happened one Mornin' James. A lady I had a Appointment with come a-hurryin' in about Four Minutes late. She was Offul' Flustered, an' I noticed she'd dropped a Twenty Doler gold piece in the Platter the Young Lady held out, instid of a Ten, like she wanted to Even Up matters, an' she ast the Young Lady, 'Do you reckon the Doctor kin see me, bein' as I'm Late?' An' it so Happened I was passin' through the Ha-

an' I heered her, an' I spoke kind o' Soothin' an' Reassurin' to her, an' told her I'd see her Presently. Then I went out in the Lab'ratory an' read the Paper awhile, an' in about Twenty Minutes I told the Young Lady to show the Woman in the Operatin' Room, an' she Done It. The Woman was Offul Apologetic. Says she, 'I had Orter apologize again, Doctor, fer bein' so Late. Fact is, I had a Engagement with my Dress-Maker, an' she kep' me Waitin', an' after a spell, when she come to wait on me—right while she was fittin' me, indeed—I seen it was time I was Due at your Offis. So I told the Dress-Maker, says I, 'I'm due at Doctor Contour's in Ten Minutes, to have a Tooth Filled; do you reckon you kin let me go in Five Minutes?' An' she said it was Doubtful, an' Whinenot let the Dentist wait? it being' a Matter of only Triflin' Importance as Compared with gittin' the Dress right.' Then the Lady she said she jis' Sailed Into that Dress-Maker, an' she give her Fits, an' she reminded her that Dentistry was a Perfession, while Dress-Makin' was n't only a Trade, an' what she'd suggested was a Insult to the Dental Profession. Then, accordin' to the lady's own account, she told the Dress-Maker she needn't finish the Dress, but send in her Bill fer what she'd already Done, an' she'd find another Dress-Maker, after she'd Got Through with havin' her Teeth Filled by Dock Contour, for this was too Serious a Matter to be Passed Over, lightly. An' to prove the Truth of what she was a-tellin' me, James, the Lady took off her Seal Skin Sacque, an' showed me the Dress-Waist, haf fitted, an' the Bastin'-Threads an' Pins showin' all along the Seams."

The Boss's Eyes rolled in a kind o' Ecstasy, as he recalled this part of his Dream. It reminded me of the Time when Mrs. Judge Perkins she was a-tellin' the Boss about how she had jis' a Short Time before took her Dress-Maker to Task fer keepin' her a-waitin' ten Minutes, an' she'd warned her that sech Dilatoriness would injure her Patronage, an' the Dress-Maker had humbly apologized, an' promised never to let it Happen Ag'in. An' this Mrs. Judge Perkins was the very woman that would make engagements with the Boss, an' she'd say, "Now don't you forget that I am to be here at Ten tomorrow, sharp, Dr. Contour. I shall expect to be Waited On promptly." Then she'd go away, an' she wouldn't keep the Appointment, nor send no Word, but about a Weak Later she'd Come In an' say, 'Tell Doctor Countour Mrs. Perkins is here, an' kin he wait on me Right Away. I've got a Important Engagement with the Milliner, in Ten Minutes."

The Boss he Rolled his Eyes awhile, then he said: "The mos' Extraornerly Experience I had in all that Dream, was this, James—A gentleman that was havin' a Tooth Filled, he Squirmed an' Twisted a Good Deal, an' I kind o' got out o' Patience with him. You see there hadn't nothin' unpleasant happened in my new Offis, up to that Time. So I ast him, 'Aint you got no Fortitude?' An' he said Right Away that he hadn't, not a Bit. 'That is, not when it comes to dental operations,' said he. 'I'm a man of Amazin' Fortitude outside o' Teeth, though,' said he. 'Ef it come to havin' my arm cut off, why I could stretch out'—

I seen exac'ly what was a-comin', James, so says I, repeatin' his words,

"I know, you could stretch out your arm, as you say"—

"Yes," says he, "I could stretch it out, an' you might take a"—

"A saw," says I.

"Yes, a saw, an' you might,"—

"Er a carving knife, er any old thing," says I.

"Jis' so," says he, "anything that would cut, an' you might whack"—

"Migh whack that arm off," I suggested.

"Why, yes, that's right, you might whack it off, an' I'd never even"—

"Wince," says I.

"No, I wouldn't never twitch a muscle," says he. "But you jis' tetch a tooth o' mine, an' I go Wild."

"I know," says I. "Say, both of us seems to of forgotten, but do you know, you, er somebody jis' like you, has been in this offis Seven Hunderd an' Eighty Four times, in years past, tellin' this same story."

The Boss set lookin' smilin'ly at me. Then in a minute he went on: "The man he never seemed to Ketch On that I was pokin' fun at him, James. Says he, 'It wasn't me, fer I vow I ain't never been in your offis before. But I don't doubt they's numbers o' others jis' like me. In fact, I know men that has stood worse things reely than havin' teeth filled, an' they never wince no more than I would of.'" "So then, James, a Bright Idee come all of a suddin to me; I out with a pin on the Sly, an' I rammed it about haf its length in his Leg. He jumped clean over a Six Foot Screen, James, an' let out a Offul Yell. It was so loud in fact, James, that it woke me up. That was sort o' Lucky fer me, James, all things considered, fer that feller's yell hadn't no very Amiable Tone."

Cincinnati, O.

FRANK W. SAGE, D. D. S.

The Dental Digest.

PUBLISHED THE FIFTEENTH DAY OF EVERY MONTH

At 2231 Prairie Avenue, Chicago,

Where All Communications Should be Addressed.

Editorial.

THE FINALE OF ONE BOGUS DIPLOMA MILL.

We publish in full in this issue the decision by Judge Chetlain in the case where a graduate of the German-American Dental College brought mandamus proceedings against the Illinois State Board of Dental Examiners to compel them to issue a license on his diploma. The decision is elaborate and able, and shows that the judge has not only mastered all the facts presented, but has applied the law with great clearness. Even the plaintiff, Mr. Stump, is satisfied with the justice of the ruling, as is shown by his letter, published in this issue of the DIGEST.

A great many interesting things were brought out during the trial, among them the revelation of the character of Huxmann, the dean of the school. He testified that he was a graduate of the German-American Dental College, and held its degree. The State Board registration book showed him to have become a registered dentist Oct. 21, 1881. After he became secretary of the Board in 1893 he changed the book so as to make it appear that he was licensed because of being a graduate of the G. A. D. C., the oddity of which is apparent when it is noted that he was then shown to have been registered on a diploma from a college which was not in existence until six years after he was actually registered. He testified that the College kept no ledger and no account of its dealings, financial or otherwise, with either the faculty or the students. When asked if students at his college paid him sums from three to six times in advance of the legal fee for procuring a license for them, Dr. Huxmann answered that he could not recollect what was paid him, although two students testified that they had paid him exorbitant sums for procuring their licenses from the State Board.

To a student in Germany who was coming to America to enter the G. A. D. C., "Prof." Huxmann wrote: "In case you are a smoker, I advise that you bring along several hundred cigars. They are very expensive here and there is no duty on broken boxes. You

would greatly oblige me if you would write to my tailor and bring along a summer overcoat for me. You would have to put it among your own clothes, and, of course, pass it as your own through the customs house at New York. . . . I would be very glad if you would bring along for me a five-quart jug of rye whisky. Should you become seasick you might use a small quantity medicinally. At the customs house in New York you will have to claim the jug as being necessary for your personal use on the ship, so a small quantity of its contents must have been used. Your address must be on the jug—under no consideration my name.”

In a letter which Huxmann wrote to Miss Frida Mueller in Germany, trying to induce her to come to America and matriculate at the G. A. D. C., he said: “Our school is entirely international. We have among our students German-Chileans, German-Roumanians, and Polanders, as well as the daughter of the president of the Board of Dental Examiners of this state, Miss Jocelyn, a native American who speaks a very little German. If you come here soon you would become her fellow-student, and through her have an opportunity to become acquainted with her father in private, and since he is the president of the Board it would under no circumstances be detrimental to you.”

The lecturers testified that they were paid anywhere from \$15 to \$30 per month, that no regular course of lectures was given, that they suited their own convenience as to time and method of teaching, that there never were any meetings of the college faculty, etc. The one who was listed by Huxmann as secretary of the College testified that he was such in name only, having none of the duties of the office, and that he never attended any meetings of the faculty.

Two witnesses testified that while students at the College Huxmann had the State Board questions before the date of examination, and gave them to the students so that they could prepare themselves for the examination before the Board.

This decision of Judge Chetlain’s virtually wipes out of existence the German-American Dental College, which has been a disgrace to this entire country, and has brought disrepute throughout all Europe upon the reputable schools of America. It may seem strange to our readers that action was not instituted long ago to stop this abuse, but two things must be remembered—first, that until recently Huxmann corrupted and made tools of certain members of the State Board, so that an indorsement of his institution could be obtained,

and certificates were issued to holders of his diplomas; and second, that the graduates from the German-American Dental College returned to Europe immediately, and so the corrupt practices of the school were known only in a general way. The abuse was so well covered up that for several months after we took up this work it looked as though we would not be able to find sufficient evidence that would stand in court to prove Huxmann's wrong-doing. The result of this trial will certainly be gratifying to the reputable men of the dental profession throughout the world. Our only regret is that we did not take up the work sooner. It is a curious coincidence that exactly one year from the time the old Board was removed by the governor Judge Chetlain's decision was rendered. This is but the beginning of the end of the disgraceful bogus diploma traffic that has been going on for years in this country.

WHERE FORGETTING IS BLISS 'TIS FOLLY TO REMEMBER.

In the June issue of *Items of Interest* the editor accused the DIGEST of stealing a paper from the *Items*. In the June issue of the DIGEST we replied to the charge and showed conclusively that the DIGEST had every right to the paper, inasmuch as the society before which it was read had given the paper to the DIGEST and *Items* for simultaneous publication. We remarked that we did not think Dr. Ottolengui had wilfully or maliciously misstated the facts, but that, judging from his general conduct, it was plain he had become so blinded by conceit that he imagined the dental world revolved around him and his journal. The only editorial in the August number of the *Items* is a four-page explanation by Dr. Ottolengui, endeavoring to show that his eight-line charge of plagiarism was nothing but a joke, and stating, "We are obliged to label the jest and explain the points of it." Judging from much of the matter that has appeared in the *Items*, we knew the publishers cared little how the journal was conducted, but we did not suppose they would allow the editor to devote the entire editorial space of one issue to an attempt to explain how he had played a joke on even so important a journal as the DIGEST. Quite in the English style—*eight lines of joke and four pages of explanation*. Pity the readers of the *Items* if the ponderous wit of its editor had attempted a full-page joke.

We withdraw our charitable belief that Dr. Ottolengui did not

wilfully misstate the facts about the paper above referred to, in view of his recent "explanation," as it contains charges that he knows are not true when he makes them. For instance, he says: "At the National meeting, Dr. Crouse, member of the executive committee, obtained the publication of the National proceedings for Dr. Crouse, editor." If Dr. Ottolengui attended the sessions of the National Dental Association as closely as he should, he would know that in 1901, when the Association chose the DIGEST as its official organ, its editor held no office in the Association. We think he did know it, and, furthermore, he is well aware that we do not have to exert any political pull to get papers, as the best societies of this country to-day have voluntarily chosen the DIGEST to represent them.

A side light is thrown on the lack of veracity displayed by the editor of the *Items*. At the recent meeting of the New Jersey State Dental Society he read a paper on "Shall Children's Teeth Be Filled With Gold." The fact was patent to everyone present that he was posing as the embodiment of the highest attainable skill in the use of gold. His argument was that amalgam should never be used in children's teeth—always use gold—and he stated that he might have forgotten, but he did not remember that he had ever used amalgam in children's teeth. Dr. Norman W. Kingsley, with whom Dr. Ottolengui was at one time associated, discussed the paper, and we present herewith the stenographer's report of his remarks:

"While the essayist was reading his paper I made a little memorandum that 'this is threshing old straw.' Professor Truman has anticipated that remark. This matter was gone over by Dr. Dwinelle and his colleagues as long ago as thirty or forty or fifty years; it is ancient history; there is nothing new in it. Nevertheless, the paper sounds well.

"Dr. Ottolengui is a master of the English language, the words come off his tongue trippingly, like the water dripping off the eaves; it is musical, and those who do not stop to analyze his essay or recall their own experience may be convinced by its dogmatism. I am very glad that Professor Truman has made his comments. They are a sufficient argument and answer to some of the statements Dr. Ottolengui has made.

"I cannot help calling to mind that Dr. Ottolengui's memory is very poor. (Laughter.) I know of many patients, ten or twelve years of age, or under, for whom he has put into sixth year molars the very amalgam which he now decries, and which he says he forgets he ever did. (Laughter.) But it is very convenient to have a forgetting faculty when one has a certain point make. It may be

the case with all of us, if we want to make a certain point, we forget that which we have done that will militate against us.

"Dr. Ottolengui is not only, as I said before, a master of the English language, but he has written several novels. His essay sounds to me like a novel, in which we know very well an author does not pretend to stick to facts. (Laughter.) He is working from his inner consciousness out of his imagination. One novel that Dr. Ottolengui wrote was called 'The Crime of the Century.' As I listened to his paper I recalled that when I read that book I did not know just what that crime was. I have found out now! (Loud laughter.) His last novel was entitled 'Final Proof.' We have to-day listened to the *final proof*. (Loud laughter.)."

Notices.

NORTHERN INDIANA DENTAL SOCIETY.

The Northern Indiana Dental Society will hold its annual convention at South Bend, September 24-25, 1902. An excellent program is provided and a large attendance is anticipated. All dentists are invited to attend and to participate in the meeting.

M. A. PAYNE, Secretary, Wabash.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION.

The fifth annual meeting of the Southern California Dental Association will be held at Riverside, Cal., October 20-21, 1902. An interesting program has been prepared, and the profession in this and neighboring states is cordially invited to be present.

L. E. FORD, Secretary, Los Angeles.

WISCONSIN STATE DENTAL SOCIETY.

At the thirty-second annual meeting of the Wisconsin State Dental Society, held at Milwaukee, July 15-17, 1902, the following officers were elected for the ensuing year: President, T. M. Welch; First Vice-President, F. D. Brennan; Second Vice-President, A. G. Fee; Secretary, W. H. Mueller; Treasurer, Adolph Gropper. The next meeting will be held at West Superior, July 21-23, 1903.

W. H. MUELLER, Secretary.

VERMONT STATE BOARD OF DENTAL EXAMINERS.

A meeting of the Vermont State Board of Dental Examiners will be held at the Pavilion Hotel, Montpelier, Wednesday, October 8, 1902, at 2 p. m., for the examination of candidates to practice dentistry. The examination will be in writing, and will include anatomy, physiology, bacteriology, chemistry, metallurgy, pathology, therapeutics, surgery, materia medica, anesthesia, operative and prosthetic dentistry, and an operation in the mouth. Candidates must come prepared with instruments, rubber dam and gold. Applica-

tions, together with the fee of ten dollars, must be filed with the secretary on or before October 1.

G. F. CHENEY, Secretary, St. Johnsbury, Vt.

SOUTH DAKOTA STATE DENTAL ASSOCIATION.

The annual meeting of the South Dakota State Dental Association was held at Watertown last month, and the following officers were elected: President, W. J. Davis; Vice-President, J. S. Goodmanson; Secretary-Treasurer, E. C. Stutenroth. The next meeting will be held at Redfield in June, 1903.

MAINE STATE DENTAL SOCIETY.

At the thirty-seventh annual meeting of the Maine State Dental Society last month the following officers were elected: President, C. H. Merritt; Vice-President, F. C. Mansfield; Secretary, H. A. Kelley; Treasurer, E. J. Roberts; Librarian, E. Bacon; Executive Committee, H. Haynes, A. W. Haskell, R. W. Bickford, C. H. Minott. The next annual meeting will be held at Kineo.

NEW JERSEY STATE DENTAL SOCIETY.

The thirty-second annual meeting of the New Jersey State Dental Society was held at Asbury Park last month, and the following officers were elected: President, F. L. Hindle; Vice-President, H. S. Sutphen; Secretary, Charles A. Meeker; Treasurer, H. A. Hull; Executive Committee, H. S. Sutphen, W. W. Hawke, F. E. Riley, W. G. Chase, A. Irwin; Member State Examining Board, B. F. Luckey.

VIRGINIA STATE DENTAL ASSOCIATION.

The Virginia State Dental Association held its thirty-third annual meeting at Old Point Comfort, August 5-7, 1902, and elected the following officers: President, B. Bridgeford; First Vice-President, I. B. Smith; Second Vice-President, R. L. Simpson; Third Vice-President, R. L. Walker; Treasurer, W. H. Ewald; Corresponding Secretary, J. H. Moore; Recording Secretary, G. F. Keese; Executive Committee, W. F. Stiff, E. J. Applewhite, E. P. Beadles.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

At the recent meeting of the National Association of Dental Examiners held at Niagara Falls last month, the following officers were elected: President, Charles A. Meeker, Newark, N. J.; Vice-President from West, B. L. Thorpe, St. Louis; Vice-President from East, J. A. Libby, Pittsburg; Vice-President from South, J. A. Hall, Collinsville, Ala.; Secretary, J. P. Root, Kansas City. Committee on Colleges, C. C. Chittenden, Madison, Wis.; J. A. Hall, Collinsville, Ala.; H. J. Burkhart, Batavia, N. Y. Committee on Conference, G. E. Mitchell, Haverhill, Mass.; J. G. Reid, Chicago; J. A. Libby, Pittsburg. Membership Committee, W. M. Darwood, Omaha; P. J. Heffern, Pawtucket, R. I.; J. E. Weirick, St. Paul. State Advisory Committee, Will-

iam Jarvie, Brooklyn; F. A. Shotwell, Rogersville, Tenn.; H. J. Allen, Washington, D. C. Committee for Promoting Relations with Foreign Examiners, William Carr, New York City; G. W. Pelzer, Great Falls, Mont.; H. W. Campbell, Suffolk, Va.; R. H. Jones, Winston, N. C. Committee on Contracts and Accommodations, J. Allen Osmun, Newark, N. J.

NATIONAL DENTAL ASSOCIATION.

The sixth annual meeting of the National Dental Association was held at Niagara Falls, N. Y., July 28-31, 1902, and the following officers were elected: President, L. G. Noel; Nashville; Vice-President for West, C. C. Chittenden, Madison, Wis.; Vice-President for East, Charles McManus, Hartford, Conn.; Vice-President for South, S. W. Foster, Atlanta; Recording Secretary, A. H. Peck, Chicago; Corresponding Secretary, W. D. Tracy, New York; Treasurer, H. W. Morgan, Nashville; Member Executive Council, Waldo E. Boardman, Boston; Publication Committee, A. H. Peck, T. L. Gilmer, G. V. I. Brown. The next meeting will be held at Asheville, N. C.

LATEST DENTAL PATENTS.

- 702,645. Impression cup, W. E. Griswold, Denver, Colo.
- 702,646. Dental tool, same.
- 702,805. Dental appliance. H. E. Lindas, Great Bend, Kan.
- 702,857. Bridgework, W. E. Griswold, Denver, Colo.
- 702,871. Bridgework, same.
- 703,063. Bur, F. F. Hawkins, Troy, N. Y.
- 703,720. Artificial denture, J. E. Dunn, Chicago.
- 703,729. Mouth-mirror, J. Kupper, Bamberg, Germany.
- 704,601. Dental cuspidor, J. E. Van Nostran, Canton, O.
- 704,937. Dental engine, A. W. Schramm, Philadelphia.
- 705,320. Forceps, S. H. B. Cochrane, Canal Winchester, O.
- 706,013. Rotary scraper, T. J. Boyce, Chicago.
- 706,016. Dental flask, F. A. Brewer, G. W. Harvey, Watsonville, Cal.

DECISION AGAINST THE GERMAN-AMERICAN DENTAL COLLEGE BY JUDGE CHETLAIN.

STATE OF ILLINOIS, } ss.
COUNTY OF COOK.

IN THE SUPERIOR COURT OF COOK COUNTY.

PEOPLE EX. REL. ETIENNE STUMP

vs.

THE STATE BOARD OF DENTAL EXAMINERS.

This is a petition by the relator, Etienne Stump, for a writ of mandamus to compel the State Board of Dental Examiners to issue to him a license to practice dentistry. The relator claims that on the 30th day of April, 1902, he then being in every way qualified to practice dentistry, applied to the Board for a license to practice in this state, exhibited a diploma from the German-American Dental College, and tendered to it the license fee of \$5.00, claiming

that he was a regular graduate of said College, and that said College was a reputable dental college, basing his right upon the mandatory provision of the law, which requires the Board to issue a license to any regular graduate of any reputable dental college without examination, and that the Board without any reasonable cause, arbitrarily, maliciously and with intent to injure the German-American Dental College, refused to grant and issue a license to him. It appears from the evidence that relator made the application to the Board April 30, 1902, exhibited his diploma from the German-American Dental College, tendered to the secretary of the Board the fee provided by law, demanded a license, and that the Board refused to issue it.

The questions involved are of grave importance, because they affect not alone the rights of petitioner, but also the rights of the German-American Dental College and other dental colleges. The Act by which the State Board is created and under which the petition was filed is entitled "An Act to insure 'the better education of practitioners of dental surgery, and to regulate the 'practice of dentistry in the State of Illinois.'" In Section 1 it is provided that "it shall be unlawful for any person who is not at the time of the passage 'of this Act engaged in the practice of dentistry in this state, to commence 'such practice unless such person shall have received a diploma from the 'faculty of some reputable dental college duly authorized by the laws of this 'state, or of some other of the United States, or by the laws of some foreign 'country, in which college or colleges there was at the time of the issue of 'such diploma annually delivered a full course of lectures and instructions in 'dental surgery.'" In Section 2 it is provided that "a Board of Examiners to 'consist of five practicing dentists is hereby created, whose duty it shall be to 'carry out the purposes and enforce the provisions of this Act." In Section 6 it is provided that "but said Board shall at all times issue a license to any 'regular graduate of any reputable dental college, without examination, upon 'the payment by such graduate to the said Board of a fee of \$5.00."

The Act does not define what a reputable college is, but vests the Board of Dental Examiners with power to determine this question, which is one of fact submitted to the Board for investigation and decision, which involves the exercise of judgment and discretion, is judicial in its nature, and when once exercised is final and not subject to review by the courts. But the discretion conferred must be fairly exercised in the interest of the public. Where it clearly appears that it has been abused or exercised arbitrarily, or with manifest injury, it may be controlled by mandamus. *Dental Examiners vs. People ex. rel.*, 123-227; *People ex. rel. vs. Dental Examiners*, 110-180; *People vs. McCoy*, 125-297.

The questions for this court to determine are:

First.—Did the Board investigate, hear and determine the question as to whether the German-American Dental College was a reputable college? *Second.*—Did it act upon proper and sufficient evidence? *Third.*—Did the Board fraudulently, or without reasonable cause, arbitrarily or maliciously, or with intent to injure the German-American Dental College, refuse to issue a license to relator?

Upon the hearing certain questions were submitted to the court. It was contended that the efficiency and scholarship of the applicant alone should

determine the question of reputability. The character of an institution of learning determines its reputability. Questions as to the efficiency, character and attainments of its instructors, the suitability of equipment and facilities for theoretical and practical work, for imparting theoretical and practical scientific knowledge, subjects to be taught, the number of lectures to be given, the number and length of the semesters, and the length of time between semesters for practical work, observation and experience not attainable in college, and the general conditions of matriculation and graduation, judged according to standards generally recognized by the dental colleges and the great body of learned practitioners throughout the country, requisite to fit students to enter upon the practice of dentistry and dental surgery, are proper subjects of inquiry and consideration in determining the question of reputability. And I may say that where these are defined by reasonable rules and regulations applicable to all colleges alike, such rules and regulations as to the matters covered by them must be held to be in full exercise of the Board's discretion. But there are other matters equally if not more important, which the Board may consider, such as the failure of a college to observe its own rules and public requirements; whether it is a mere commercial enterprise and graduates students for money, without reference to scholarship, or seeks by money or other disreputable means to secure recognition or licenses for its students from the State Board, or is otherwise guilty of conduct which in the ordinary sense of the word is not "reputable."

It will be observed that the law places no limit upon the methods by which the State Board shall investigate and gather information bearing upon the question of reputability. Considering the purpose of the Act, a broad latitude must be accorded, as the law undoubtedly gives the Board the right to proceed in any reasonable way and to exercise its discretion in any reasonable manner it may see fit. It is contended that the Board has no power to establish rules and regulations defining what shall constitute sufficient education and training to practice dentistry, or determine what shall be required to make a college a "reputable" institution. It is further contended that some of the rules and regulations established by the Board are not calculated to test the real standing of dental colleges.

The purpose of the Act expressed in its title is "to insure the better education of practitioners of dental surgery, and to regulate the practice of dentists." By Section 2 a Board of Dental Examiners is created, consisting of five practicing dentists, "whose duty it shall be to carry out the purpose and enforce the provisions of this Act." While there is no express provision authorizing and empowering the Board to establish rules and regulations, I am of the opinion that the adoption of rules and regulations is clearly within the purview of the Act, and that the Board as an incident to the powers expressly conferred has the power to define its discretion by the adoption of rules and regulations, but these must be reasonable, general and applicable to all colleges alike. Students desiring to qualify themselves to practice dentistry, colleges engaged in qualifying them and the public generally have a right to know what courses of study, requirements and general conditions will entitle a college to be classed as reputable.

I am of the opinion that the Board not only has the power to pass such

rules and regulations, but that it is incumbent upon it so to do, and so far as possible to establish and promulgate them as the basis of the exercise of its discretion. The conditions and requirements for the determination of so important a right should not be left to the arbitrary determination of the Board upon evidence and rules and regulations not made public. I have carefully considered the general rules and regulations in force at the time the relator applied for a license, and hold that, with the possible exception of that part of Rule 4 which requires certain evidence of an English education, they are fair and reasonable. The Board may require that all examinations shall be held in the English language, but the provision that one shall not be entitled to practice dentistry in this state who is otherwise qualified, because he does not produce the evidence of a good English education required in that rule, is a doubtful exercise of the power conferred upon the Board. In determining the question of the reputability of the German-American Dental College the Board had the right to consider the requirements prescribed in its rules and regulations then in force, and I find that they did consider them in passing upon the application of relator. While a general rule or regulation as to any one condition or requirement must be held to be the full exercise of the Board's discretion as to such condition or requirement, nevertheless, the adoption of general rules and regulations is not the limit of the Board's discretion. It may consider any proper evidence bearing upon the question of reputability.

It appears from the evidence that the German-American Dental College was incorporated in 1888; that Dr. Fritz W. Huxmann is and always has been its Dean, and that as early as 1891 and, in fact, ever since its incorporation, the State Board has had trouble with it. Dr. Charles R. E. Koch, who was a member of the Board from 1886 to 1891, testified that at that time he and the members of the Board were of the opinion that instruction sufficient in quantity and quality was not given to make the College reputable, and that the respondent's chief purpose seemed to be to graduate foreigners who did not expect to practice dentistry in this country; and that in 1890 or 1891 it was denied recognition. It appears that it was not recognized as reputable, if at all, until the resolution of the Board of November 14, 1893, making all dental colleges reputable which consented to an examination of their candidates by a member or members of the Board before graduation.

Dr. H. W. Pitner, a member of the Board from May 10, 1897, to August 10, 1901, President of the Board two years, a witness for the relator, testified that the Board had been having trouble with the German-American Dental College ever since its organization; that many rumors were abroad reflecting upon its integrity and the integrity of the members of the Board; and also had trouble with Dr. Huxmann in regard to translations, and the agreement of June 18, 1900. Dr. W. C. Jocelyn, a member of the Board from 1897 to 1901, President of the Board from 1897 to 1899, also a witness for relator, testified to troubles with said College and with Dr. Huxmann.

It appears that in 1897 the Board adopted a list of colleges whose diplomas were recognized as reputable. The German-American Dental College does not appear on it. I do not recall evidence of a single instance where a license was issued by the Board upon the diploma of the College alone. The

record does not disclose any inference of recognition from licenses issued upon diplomas, except such as may be drawn from cases where they were issued after examination of the applicants by the Board. In the recitals of the agreement of June 18, 1900, between the Board and the College, granting the German-American Dental College the right to adopt a college course of one-half the duration required of other dental colleges, it appears that the question as to whether the Board had recognized the College as reputable was in dispute. It is true that the resolution offered by one J. H. Smyser, then a member of the Board, and now under indictment for the gravest offences committed in the discharge of his duty, was passed, providing that, "in compliance with the laws of the State of Illinois, and in compliance with the rules and regulations governing the Board of Dental Examiners, as published in a report to the Governor for 1899, the diplomas of the German-American Dental College will be recognized." But the form and meaning of this resolution were at once questioned, and August 12, 1901, by a unanimous vote of the Board, this resolution was rescinded and a substitute was passed, providing for recognition of the German-American Dental College only upon compliance with the general rules and regulations of the Board then in force. This resolution also provided that the Board accept a consecutive course of study of eighteen months at the German-American Dental College as equivalent to a full three years' course of study in the English-speaking schools, which was in direct violation of the general rules and regulations then in force.

It will be seen that through influences not fully disclosed by the evidence the German-American Dental College frequently sought for and obtained special privileges from the Board, that it was a constant source of trouble, and that its standing as a reputable college was continually in dispute. If compliance with the rules and regulations of the Board be the test, the evidence fails to show that said College was ever at any time entitled to recognition. In this connection I may say, that the agreement of June 18, 1900, giving to said College the right to adopt a college course one-half the duration required of all other dental colleges, which conferred upon it a special privilege not granted to other colleges, was in direct conflict with the general rules of the Board on that subject (which the Court holds to be the measure and limit of the Board's discretion), was manifestly entered into not for the benefit of the public, but for the private benefit of the College, and was therefore null and void. Likewise, that portion of the resolution of August 12, 1901, above referred to, conferring a special privilege as to the time of study so far as it seeks to exempt the College from the operation of the general rules and regulations of the Board, is held to be a clear abuse of the discretion of the Board, and absolutely void, and the German-American Dental College, the illegal beneficiary of the special privilege thereby conferred, can not receive any benefit therefrom. All other similar acts from said Board must be held for naught. Where the Board, whether actuated by proper or improper considerations in the exercise of its discretion, by rule, resolution, agreement, contract or other action, exempts any college from the operation of its general rules and regulations, such action must be held a clear abuse of its discretion and therefore void.

On April 30, 1902, when relator applied for his license, it may be fairly inferred from the evidence that the members of the Board were cognizant of all matters of record touching the German-American Dental College. Dr. J. G. Reid, at that time a member of the Board, had been on the Board for a number of years, and was acquainted with the College, its previous history and its Dean. The evidence shows that relator made his application personally and by attorney appeared before the Board. He was informed that the Board was not satisfied that the German-American Dental College was a reputable college, and the Board asked for further information. While there is some conflict in the evidence, several witnesses testify that the Board asked for a schedule of lectures, and that the relator and his attorney then left. May 1, 1902, the relator and his attorney again appeared before the Board. They submitted only a catalogue, which the Board already had, and the relator, through his attorney, told the Board that they were not obliged to furnish further evidence, and declined to do so, basing the relator's rights upon the diploma. The Board thereupon took action, the record of which is as follows: "The application of Etienne Stump for a license on a diploma from the German-American Dental College was renewed before the Board and refused for the reason that the Board was not satisfied with the reputability of the German-American Dental College."

The Court holds that the foregoing action of the Board was in effect a determination by the Board that the College was not reputable, but whether or not this be so, it appears from the evidence that there was a hearing of the question and the special request made by the Board for further information. The burden of furnishing further evidence and demonstrating the reputable character of the College was on the relator and not on the Board (*State ex rel. vs. Chittenden*, late decision Supreme Court of Wisconsin). Especially should this be so in this case, where it is conceded that the college had not complied with many of the general laws, rules and regulations of the Board then in force, and had not complied with Sub-rule 7, which imposes the duty on all colleges seeking recognition to submit certain information to the Board. The printed catalogues and literature of the College as to the time of study and other requirements were in direct conflict with those of the Board. In argument much stress was laid on the claim that the Board had previously recognized the college as reputable. Even although it had been so recognized, the Board had the right at any time for good cause to withdraw such recognition, a right which the Board very properly saw fit to define by a special rule.

It further appears from the evidence that in October, 1901, all the members of the Board visited the college, and they testify that they were not satisfied with the facilities and equipment of the institution; that they found no schedule of lectures, and obtained only such meager information as appears in relator's "Exhibit 2."

The printed literature of the College contains what purports to be, but what is not, a copy of a letter from the Governor of this state. It was evidently published and circulated for the purpose of impressing the public with the belief that the College was a college in regular standing and had been recognized by the State Board since 1893, and that a communication from the highest official source attested the fact that the records of the Board of

Dental Examiners so showed. I cannot but feel that this copy was deliberately made for an improper, selfish purpose, and was well calculated to deceive the public.

It is fair to infer from the evidence that the Board was in possession of all these facts at the time the relator made his application for a license.

The Court upon the hearing, against the objection of relator, admitted evidence of the general reputation of the College April 30, 1902, only, however, upon the promise of evidence to show that the members of the Board had knowledge of such general reputation at that time. This evidence was admitted upon the theory that the Board might avail itself of all knowledge from all reliable sources, and might possibly consider the fact of general reputation. Although upon the issue it was entitled in any event to but little weight, it might with all other facts in evidence then before the Board be considered on the hearing. It was shown that Dr. Reid at that time had knowledge of the general reputation of the College.

I therefore find from the evidence that the Board heard and determined the question as to whether the College was a reputable college; that it had before it competent evidence, both direct and circumstantial, touching upon the question. I therefore hold as a matter of law that its action was final. The cases cited above, and many others too numerous to mention, fully sustain this proposition.

The evidence fails to show that the Board or any member of the Board acted arbitrarily, without cause or maliciously, and with intent to injure the College. All the members of the present Board took the stand. They testified like fair men, having no feelings of enmity or revenge, no private interests to serve. The record fails to disclose any motive on their part to act arbitrarily or maliciously. By profession they are practicing dentists, apparently men of large experience, scholarly attainments and high character. Their testimony, and their conduct and demeanor while testifying, impressed me with the belief that in passing upon relator's application they were actuated solely by desire to fairly and impartially consider and determine the question as to the reputability of the College, and that the action taken was the honest and deliberate judgment of the Board. Counsel to justify the issuance of a writ of mandamus sought to affirmatively prove that the College was in fact a reputable College. In this I think he failed. Upon that issue a wide latitude of proof was allowed.

It appears from the evidence that Dr. Fritz W. Huxmann is and has been the head and front of the institution, I might say its greater part. It appears there were no meetings of the faculty, and no regular books were kept, and when counsel for the respondent asked for the book containing the names of students who had matriculated, it was not produced. The attitude of Dr. Huxmann was inconsistent. While claiming the benefit of the law and to be entitled to recognition, he utterly ignored the rules and regulations of the Board, sending out catalogues and prospectuses since the adoption of the rules and regulations October 18, 1901, showing a course of study of only three successive semesters of six months each, in direct violation of such rules and regulations.

While I have nothing to say against the worth and standing of the doctors

who were instructors in the branches assigned them, I think upon a fair and impartial consideration of all the evidence any disinterested person would say that the chairs of the institution were not properly filled. There was an entire lack of harmony between the members of the so-called faculty. In fact, some were not even acquainted with others, and their appearance on the witness stand did not impress me with the fact that they were imbued with the high spirit and appreciated the great responsibility that are attached to their positions. The evidence shows that in matriculating students Dr. Huxmann did not always observe the conditions prescribed in the rules and regulations of the Board. If the testimony of some of the witnesses may be believed, Dr. Huxmann promised speedy graduation, contrary to the printed requirements of his College, as well as those of the Board, and during an examination by the State Board he furnished answers to questions to his students in advance. The evidence shows that part of the time for the past ten years Dr. Huxmann was himself a member of the Board and was closely associated with the members of the Board, and a part of that time was translator for the Board of the examination papers of the students from his own College; that he continuously sought and availed himself of advantages and privileges not accorded to other colleges, in direct violation of the rules of the Board. Whether these concessions were the result of sinister influence, or the unsolicited favors of the generous Board, we are left to conjecture. They were at least illegal and unjust. Several letters of the Dean were read in evidence. While not going into the details as to the matters therein contained, suffice it to say that they were of a character and upon subjects not such as to exemplify his fitness for a deanship, and tend to afford corroborative proof that he does not fitly represent the dignity of his position as dean of an institution which claims the right to and does confer degrees.

The evidence is conflicting on the question as to equipment and facilities. The members of the Board visited the College at an inopportune time, when a change of location to a new building necessitated moving, and at a time when installation had not been completed. While not elaborate, I think it may be justly said that for a small institution the College was fairly well equipped.

I shall not take time to further point out and particularize any of the facts which were elicited upon the hearing, but find from all the evidence that the relator has failed to make out his case by a preponderance of the evidence. The tendency of the times in all departments of human endeavor, and especially in the professions, is to require of students a more thorough and comprehensive knowledge of the subjects, greater opportunities for theoretical and practical instruction, larger courses of study and greater general efficiency. It is to be regretted that the equipment, facilities and advantages suitable for adequate and thorough education render it almost impossible for poor men, however ambitious and learned, to properly prepare young men for their lifework and equip them with the knowledge and practical experience in all departments of study which render them proficient and worthy of a degree, but the poverty of worthy men is no excuse for failure to observe the reasonable requirements of the state for the protection of its people from unskillful and uneducated practitioners. Equally untenable and unworthy is the

suggestion of the Dean of the German-American Dental College, that the influences of college trusts, of which there is no evidence, and the action of the Board in establishing severer requirements for matriculation and graduation indicate a desire to discriminate against the German language and German institutions. If the Board has erred in this regard, it is in following the example of Germany, whose requirements exceed those of any other country, whose scholars lead the world in thoroughness and proficiency, and whose schools of learning are the glory of that sturdy people.

Upon a careful consideration of all the evidence in the case, I am constrained to deny the prayer of relator's petition, and the petition will be dismissed with costs to be taxed.

News Summary.

L. P. RUFF, a dentist at St. Louis, died Aug. 1, 1902.

A. WILKES SMITH, a dentist at Richmond, Ky., died July 27, 1902.

HENRY HAUENSTEIN, a dentist at Brooksville, Miss., died July 25, 1902.

AARON AMES, 71 years old, a dentist at Kankakee, Ill., died Aug. 2, 1902.

R. C. BROWER, a dentist at San Francisco, committed suicide July 10, 1902.

F. A. STRAYER, formerly a dentist at Jefferson, Ia., is dying from consumption.

N. T. FOLSOM, 79 years old, a dentist at Manchester, N. H., died July 14, 1902.

S. B. BISHOP, 50 years old, a dentist at Pittsburg, died of heart disease July 20, 1902.

J. A. WHITE, a dentist at Saginaw, Mich., 39 years old, was drowned Aug. 11, 1902.

A. M. CALLAHAM, 62 years old, and formerly a dentist at Topeka, Kan., died July 13, 1902.

J. W. LOPP, a dentist at Columbus, Ind., died suddenly from heart failure July 14, 1902.

C. F. RICHARDSON, a dentist at Helena, Mont., died July 13, 1902, from heart disease.

D. F. ROBINSON, a young dentist at Montgomery, Ala., was killed in a quarrel Aug. 9, 1902.

C. C. HAZEN, 44 years old, a dentist at Council Bluffs, Ia., died from paralysis July 13, 1902.

C. T. PELLERIN, 54 years old, and formerly a dentist at Montreal, Canada, died July 14, 1902.

FRANK L. BOOTH, 28 years old, a dentist at Victor, N. Y., died Aug. 8, 1902, from consumption.

EASTERN ONTARIO DENTAL ASSOCIATION closed its twenty-third annual session at Cornwall, Ont., July 10, and elected the following officers: President,

Dr. Clark; Vice-President, A. J. Gunn; Secretary and Treasurer, W. B. Cavanaugh.

W. B. SHORT, 69 years old, a dentist at New York City, died from apoplexy July 18, 1902.

W. V. ELLIOTT, 41 years old, a dentist at Elmira, N. Y., died of typhoid fever July 20, 1902.

J. D. TODD, 56 years old, a dentist at Denver, Colo., died suddenly July 28, 1902, of septic fever.

S. G. HOLLAND, 71 years old, a dentist at Atlanta, Ga., died from heart failure July 13, 1902.

C. A. SHANNON, 60 years old, a dentist at Stephens City, Va., died July 18, 1902, from appendicitis.

W. H. CUMMINGS, 32 years old, a dentist at Syracuse, N. Y., died of spinal meningitis July 14, 1902.

T. ACHILLIS, a young dentist at Muskegon, Mich., was instantly killed July 15, 1902, by touching a live electric wire.

J. P. WILLIAMS, 40 years old, a dentist at Chattanooga, Tenn., died suddenly Aug. 11, 1902, from heart disease.

A. W. HARLAN of Chicago, ex-editor of the *Dental Review*, was married to Mary E. Gallup, a dentist of Boston, June 30, 1902.

J. J. REED has sold his practice at Rockford, Ill., and located at Beloit, Wis. He will be married to Miss Nellie Kimball in the near future.

COLLEGE INCORPORATED.—August 5 the "Memphis College of Dentistry" was incorporated at Memphis, Tenn., with a capital stock of \$20,000.

BANKRUPT.—J. S. Romine, a dentist at Mitchell, Neb., has left town suddenly, leaving several thousand dollars' worth of debts and no assets.

EARL F. MUNSON, 20 years old, was drowned July 15, 1902. He was the son of C. W. Munson, the well-known dealer in dental supplies at Toledo.

HOWARD GRAY, 21 years old, a dentist at Tonawanda, N. Y., was drowned Aug. 4, 1902, while trying to save the life of a girl who had fallen into the Niagara River.

PHYSICIANS' PROPORTIONS.—The *Medical Times* states that according to the latest census every physician in the United States has 655 persons to look to for his support.

PENSACOLA (FLA.) DENTAL SOCIETY was organized August 11, 1902, and the following officers were elected: President, C. R. Mitchell; Secretary, H. H. Boulter.

TOO STRONG.—Dr. T. E. Strong, a dentist at San Francisco, was last month fined \$30 for assault and battery upon a patient who complained that a set of teeth did not fit.

FIRES.—Drs. Cook and Van Verst, August 9, Holland, Mich., small fire caused by a leak in a gasoline stove.—W. H. Gelston, Philadelphia, July 31, \$200.—A dentist in New York City had his office damaged to the extent of \$100 by fire and water July 25.—Dr. Mullins, Lee, Mass., \$1,000, August 14.—

Meriwether & Cheatham, Cadiz, Ky., July 20, \$100; no insurance.—M. W. Snow, Salt Lake City, Utah., July 15, \$3,000; insurance \$1,700.

NEVER TOO LATE.—A New Jersey woman aged 65 gave birth to a girl. Husband 70. Trains leading out of Jersey are thronged with terror-stricken old women.

HOSPITAL DENTIST REMOVED.—At the last meeting of the Board of Directors of the Eastern State Hospital of Virginia, the office of dentist at the institution was abolished.

FAYETTE COUNTY (O.) DENTAL ASSOCIATION was organized last month, and the following officers were elected: President, E. C. Hamilton; Secretary, G. B. Saxton; Treasurer, A. M. Bush.

MARKET REPORT.—From the market review of the *New England Druggist* for April we gather that Japan wax is firmer, asafetida is strong, and "epsom salts are moving steadily into the regular channels."

DIVORCES.—Mrs. J. B. Entrikin on July 25 was granted a divorce from her husband, a dentist at Des Moines, Ia.—Mrs. J. S. Wilson has brought suit for divorce against her husband, a dentist of Bristol, Conn.

FOREIGNERS.—In Europe ten out of every 1,000 people are living out of their own country; in America, 137 out of every 1,000, while 300 out of every 1,000 Australians were born in some other part of the world.

EARLY DENTITION.—Dr. Zeleski reported the case of a syphilitic infant in whom the first tooth appeared at the end of the first month; 7 weeks later a second tooth appeared on the lower jaw.—*Phila. Med. Jour.*

REPLEVIN SUIT FOR TEETH.—A woman in Grand Rapids, Mich., has brought a replevin suit against her dentist to recover her set of teeth, which the dentist refuses to give up until the last payment is made on same.

"SOME ACHIEVE GREATNESS."—W. C. Root, a dentist at Oyster Bay, the President's summer home, has achieved a sort of cheap notoriety by refusing to allow President Roosevelt to use his rooms during the five weekdays that he was not there filling teeth.

BLEACHING PINK RUBBER.—I have found that the quickest way to bleach pink rubber is to focus upon it the rays of the magnifying glass, taking care not to burn it, as this method gives you a beautifully bleached pink in about five minutes.—*L. Arndt, D.D.S.*

REMOVING PLASTER.—Sugar placed in water, or the use of simple syrup, will greatly facilitate the removal of plaster of Paris from the hands after applying plaster dressings. The use of sweet oil is also serviceable for this purpose.—*Internat. Jour. of Surgery.*

ACHING VOID.—"Brooks," said Rivers, "that's the second time I've heard you use the phrase 'aching void.' I wish you would tell me how a void can ache?" "Well," said Brooks, reflecting a moment, "not to speak of a hollow tooth, don't you sometimes have the headache?"—*Chicago Tribune.*

STILL MORE APPRECIATION.—"I send subscription for 1902 and for 1903 in advance, as I would not care to get along without your valuable paper." F. C. Runge, Jr., Houghton, Mich.—"The Digest is an up-to-date magazine, and congratulations are due the editor for its management." J. F. Gallo-

way, Santa Ana, Cal.—“The DIGEST is well worth the money.” E. L. Yard, Florence, Colo.

“PARALYSIS?” said an Irishman. “It’s the dis’ase that makes ye so that every time ye move ye can’t stir.”

BURGLAR BURGLER.—It is reported that Dr. L. W. Skidmore of Moline, Ill., discovered a burglar in his office the other day, and scared him away before he could take anything. After he had left the doctor found a new \$100 bill on the floor, which the burglar had dropped in his excitement. Dr. Skidmore says, “Come again.”

“BY THEIR DEEDS YE SHALL KNOW THEM.”—“Dr. Blair, the painless tooth extractor, will be here next week. He is well known, as he extracted 1,000 teeth here two weeks ago. Don’t fail to see him, as this will probably be his last visit.”—Owosso, Mich., *Press-American*. Probably there are no more teeth left in the town.

DENSITY OF POPULATION in foreign countries has recently been computed. Great Britain leads with 132 inhabitants per square kilometer, which is equal to 0.3861 square mile; then comes Japan, 114.4; Italy, 106.6; the German Empire, 104.2; then comes Austria, 87; Hungary, 59.6; France, 72.2; Spain, 85.9; United States, 8.4; Russia, 5.9.

SPITTOONS, TO KEEP CLEAN.—Mr. A. W. Wright, Jr., of London finds that a little sulphate of copper sprinkled inside the spittoon (metal or earthenware) before the day’s operations commence, prevents any unpleasant odor, does not allow the interior of the spittoon to become furred, and renders it much easier to cleanse than usual.—*Ash’s Circular*.

INSOMNIA CURE.—A very simple method of inducing sleep in cases of persistent insomnia, and one that has succeeded where many drugs have failed, is: Simply administer a moderate amount of liquid food before the patient goes to bed. This diverts the blood from the brain to the abdominal organs, and takes away the cerebral excitement that precludes sleep.—*N. Y. Medical Journal*.

OSTEOPATH.—For there wasn’t a tendon or muscle

He hadn’t located quite pat;
Each ligament, too, in the inside of you
He knew just the point it was at;
This osteologic perception,
So intense, almost rendered you silly;
And we called him atomical, tiny and comical,
Cute, anatomical Willie.

—*Town Topics*.

COUNTRY DOCTOR.—Just across the border in Maryland a few years ago an old country doctor died. He had given a half century to the people of his county. He had never declined to answer a call, however bad the weather, or however poor the patient. In a material sense his life was not a great success, for he cared little for money and generally gave away what he got. But after his death the people realized what he had been to them and their children and their children’s children. So they met and raised a goodly sum and erected a monument to him. It was one of the most genuine tributes to

simple goodness ever known, and in all counties and in all sections are country doctors who deserve larger appreciation while they live and noble memorials after they die.—*American Medicine*.

GREAT AGE FOR GIRLS.—"It's a great snap to be a working girl," declared the Rev. Dr. P. S. Henson. "They're working into the doctors' and dentists' offices, and the pulpit, the banks, the stores—about the only chance the men will have soon will be to get off the earth. We are beginning to sympathize with the man who went to the war and cried at the sight of blood. 'Don't be a baby, Jolin,' said his comrades. 'I—I wish I was a baby,' he sobbed, 'and a girl baby, too.'"—*Ex*.

QUESTION OF VACCINATION.—He was sitting by her side at dinner, proudly congratulating himself upon being where he could look down upon the beautiful neck and arms. "I am being tortured," she said, as she moved uneasily. "I have been vaccinated, and it is just 'taking.'" "Why," he said, unguardedly, as he cast another glance at that handsome neck and those lovely arms, "where were you vaccinated?" "In Boston," she replied, as a smile drove away the evidences of pain.—*Med. Standard*.

EXAMINING BOARD AFFAIRS.—C. S. Searles of Dubuque has been appointed by the governor to succeed J. S. Kulp of Muscatine, as a member of the Iowa State Board of Dental Examiners.—The Massachusetts State Board of Registration in Dentistry met in June and passed 43 out of 98 applicants for license.—The North Dakota State Board of Dental Examiners met in July and passed fourteen applicants.—The Vermont State Board of Dental Examiners met July 9 and passed nine out of thirteen applicants.

ROBBERIES.—Burglars at Evanston, Ill., looted the office of a dentist of \$70 worth of material and tools, and also exchanged shoes with the owner of the office.—July 16 the office of a dentist at New Albany, Ind., was robbed of \$35 worth of gold.—July 12 the offices of five dentists at Sandusky, O., were robbed of \$200 worth of material and tools.—July 26 \$50 worth of gold was taken from a dentist's office at Allentown, Pa.—August 7 a young man was arrested in Jersey City, and confessed to having robbed the offices of fifteen dentists in towns through the state.—Several dentists in New York have been robbed by a man who calls to have a bridge made, and who takes everything portable while the dentist is called out of the office a moment by a confederate of the robber.

ALCOHOL; ITS EFFECT ON DIGESTION.—In a paper on the effect of alcohol on digestion, Dr. J. A. Storck reaches the following conclusions: (1) Small quantities of alcohol favor salivary and gastric digestion; large quantities inhibit salivary, gastric and pancreatic digestion. (2) Alcohol, whisky, gin and brandy are less harmful to the digestive processes than are malt liquors and wines. (3) The continuous use of alcohol, even in small amounts, is liable to prove detrimental to the digestive process. (4) In persons of weak digestion, alcohol as a rule is harmful, unless given well diluted. (5) Strong alcoholics should never be given when the stomach is free of food. (6) Alcohol is a valuable food in disease; requiring no primary assimilation, it yields force rapidly to an exhausted system and in small quantities it promotes appetite. (7) It is well to bear in mind that the purer the whisky or brandy,

the less liable it is to produce digestive disturbances. (8) Finally, it is true, as Wood says, that "Science in no way contradicts the experience of every *bon vivant* that the small doses of alcohol increase, and larger amounts interfere with, the activity of digestion."—*N. O. Med. Surg. Jour.*

GELATIN AS A HEMOSTATIC.—Miwa quotes the works of a Chinese physician dating from 204 to 219 A. D., in which gelatin is recommended as a hemostatic for all kinds of hemorrhage. It has been in use ever since for this purpose in China and for a thousand years in Japan. It was applied in an aqueous solution or as a powder, usually combined with other substances. It also enjoyed a reputation as a regenerator of the blood.—*Centralb. f. Chir., Jour. A. M. A.*

FAKIRS CAUSE TROUBLE.—A wail follows the visit to Auburn, Neb., of a firm of traveling dentists who visited the town last month, as it is stated that everyone treated by them required the services of a physician later for hemorrhage, blood-poisoning, dislocation of jaw, etc.—Two men in Maysville, Ky., did a land office business for six weeks and then disappeared, leaving numerous unpaid bills and a host of gullible patients with aching teeth, defective fillings, etc. Verily, verily, a sucker is born every minute.

DIVORCE UNHEALTHY.—Prussian vital statistics recently published seem to show a relation of some sort between divorce, insanity and suicide. Out of a million persons, 348 divorced women committed suicide as compared with 61 married women; 386 married men committed suicide as compared with 2,834 divorced ones. In the insane asylums in Wurtemberg a similar study shows 3,024 persons who have been divorced as compared with 283 married persons, 460 bachelors and maids, and 672 widows and widowers.

FAITH AND TOOTHACHE.—The Christian Scientist had labored long and earnestly with the dentist, to convince him that there was no such thing as pain, and he closed the discussion by saying, "Faith will move mountains." One week later he reported with a swollen jaw and a raging toothache, and stated that while faith might move mountains it seemed to have no effect on a cavity.

MARRIED.—M. A. H. Jones, Iowa City, Ia.—Frances Barnett, Shelby, Ia., July 23, 1902. H. C. King, Bakersfield, Cal.—Carrie F. Sparks, Bakersfield, Cal., July 27. J. W. Marsh, Warsaw, Ill.—Lucy S. Cherrill, Carthage, Ill., June 12. L. G. Osmun, Glen Ridge, N. J.—Harriet Sholl, New York, July 12. C. Saunders, Denton, Tex.—Frances H. Hanson, Niles, O., Aug. 12. Charles Smith, Chicago—Martha Williams, Medea, Pa., July 10. J. L. Trinkhaus, Peoria—Marie Breitenbach, Chelsea, Mich., July 15. J. J. Volker, Alexandria, Minn.—Anna E. McCallan, July 30.

FINISHING ALUMINUM PLATES.—By V. I. Miller, D.D.S., Fostoria, O. I have been using a method of finishing aluminum plates which I have found more satisfactory than any polish I have been able to get on them, and thought it might be of interest. After rubber attachments are polished: First, wash the plate in benzine or gasoline to remove any grease or oil that may be on the plate; second, apply a 40 per cent solution of caustic potash; third, nitric acid, full strength, then wash in clear water. The potash and

acid may be conveyed by means of a small piece of cotton held in soldering pliers. I have plates treated in this manner that have been worn about two years and their appearance is still very pleasing.—*Summary*.

ILLEGAL PRACTITIONERS.—A dentist of Oswego, Ind., was fined \$35 August 6 for practicing dentistry without a license. Complaint was made by a patient, who claimed the work was unsatisfactory. A dentist at Virginia City, Mont., was arrested August 13 for failure to have a license, and put up a cash bond for his appearance for a trial. Two dentists at McKeesport, Pa., managers of "Painless Dentistry" parlors, skipped out when threatened with arrest for practicing without being registered. A dentist at Boyd, Wis., was fined \$25 July 23 for failure to have a state license.

RHEUMATIC DISEASE OF TEMPORO-MAXILLARY ARTICULATION.—Hanım (*Munchener med. Woch.*) describes a case in which the patient, a man of forty-five years, could not press the jaws together without severe pain. A small blood cyst of the external auditory canal was found and punctured, but without relief to the painful mastication. After a week of useless therapy, the condition quickly subsided under the administration of sodium salicylate, and the author says that in similar cases of obscure pain in this region one should always keep this unusual but possible lesion in mind.

"INTERVIEWITIS" is a word nearly as good and entirely as bad as many that have been recently coined, and it is surely on a par with the thing it is designed to name. Almost every week one sees reports of interviews in the daily papers, all properly earmarked, none ever disavowed, in which it is plain that the doctor has been only too eager to be quoted. The interview is usually upon a matter about which the physician named has little knowledge and no special qualification for instructing the lay public whatever. His opinions are therefore without weight, and are almost always absurdly trite or erroneous.—*Amer. Med.*

INTESTINAL OBSTRUCTION CAUSED BY TOOTH.—Dr. Godfrey Warner of London was called to see a dentist in his neighborhood, and on arrival found him dead. The history was simply that the night previous he was taken ill with colic. The autopsy showed all the organs normal; but about midway between the duodenum and large intestine there was an obstruction in the shape of a hard foreign body. On examination it was found to be a molar tooth encysted in a membrane, which had become attached to the inner wall of the gut. It was a natural tooth and had evidently been there for a long time.—*Merck's Archives*.

TOBACCO SMOKE; ITS ACTION ON MICROBES.—Tobacco smoke has long been esteemed by many to have a protective action in certain epidemics. Dunon, a French observer, has recently endeavored to estimate the true value of the idea by studying the action of smoke on the development and virulence of numerous organisms. He finds that whereas tobacco smoke has no influence on the development of the bacilli of tetanus, of typhoid fever, of streptococcus, or of tetragenus, it does modify considerably the development of the organisms of pneumonia, diphtheria, tuberculosis, gripe, and of the staphylococcus. It is therefore possible that tobacco smoking may have a valuable prophylactic function, and may be wisely employed by those attending cer-

tain diseases, in which the development of the infection occurs in the mouth.
—*Med. Age.*

BLOOD POISON CURED BY ELECTRICITY.—A surgeon accidentally pricked his finger during an operation and became infected. The hand and arm began to swell and the surgeon became delirious. A needle attached to the negative pole of a fifty-cell galvanic battery was thrust deeply into the finger at the point of inoculation. Electrolysis, with the full capacity of the fifty-cell battery, followed for about one minute. After this treatment the pain and swelling subsided. Then strong galvanic currents were passed through the inflamed lymphatics by means of surface electrode. Other electrical treatment followed and effected a cure.—*Lancet.*

MEASURING MEDICINES.—In measuring medicines, or in speaking of their doses, the word drop should be left out and the word minim substituted. Drops vary with the form and material of the containers from which they are dropped, and also with the mobility and density or tenacity of the fluid. To illustrate: Sixty drops of water will measure sixty minims. Fifty drops of syrup or gum arabic will measure sixty minims. Two hundred and fifty drops of chloroform will measure sixty minims. Watery fluids—one drop equals one minim. Alcohol fluids—two drops equal one minim. Ethereal fluids—four drops equal one minim.—*Exchange.*

HEALTH FOOD AD.—The day of his execution had come.

He arose, dressed himself and performed his ablutions.

"What will you like for breakfast?" asked the kind-hearted jailer.

"I suppose you have ham and eggs, fried potatoes and coffee?" said the condemned man.

"Yes," replied the jailer.

"Well, I don't want them," he rejoined, with a discordant laugh. "Bring me some kind of health food and a cup of cereal coffee, and I will die with joy."—*Med. Standard.*

EXPERT EVIDENCE AND TESTAMENTARY CAPACITY.—The Supreme Court of Iowa holds, in the case of *Marshall vs. Hanby*, that it is not for a witness, though an expert, to say what will constitute capacity. That is a question of law for the court, and when advised the jurors are to say whether, in view of all the evidence, it was possessed by the deceased at the time the will was signed. The opinion of the expert must be limited to the estimate of the mental condition of the person concerning whom inquiry is made, and never allowed to be given as to the effect of that condition upon the particular transaction being investigated.—*Jour. A. M. A.*

LEFT-HANDEDNESS.—Leuddeckens claims that this is not a habit but is always due to physiological causes, often an expression of the influence of heredity. Normally the blood-pressure is greater in the left cerebral hemisphere than on the right side. When this pressure is stronger upon the right side, left-handedness results. In one case reported, in which the pressure was equal in both hemispheres, an alternating preponderance of one or the other side occurred, depending upon blood-pressure variations. The term left-handedness is unsuitable, since phenomena are noted upon one entire side of the body, as Leuddeckens noticed in the case of his young son. He

believes that all attempts to overcome left-handedness should be stopped, since a high degree of efficiency upon that side may be acquired.—*Zeitschrift für Psychologie und Physiologie der Sinnesorgane*.

ADRENALIN IN ANESTHETIC SOLUTIONS.—From experiments Elsberg is convinced that the addition of adrenalin chlorid in proportion of 1 to 5,000 to 1 to 20,000 solution for local anesthesia has a distinct value in minor operative surgery in that it almost entirely does away with the oozing of blood from the wound. As adrenalin is a cardiac stimulant, he says it has the additional advantage that it will counteract the depressing effect of the eucaïn or cocain; because it keeps the local blood vessels firmly contracted for a number of hours, it will prevent the congestion, and hence the pain which is so apt to follow after the anesthetic effects have worn off.—*Am. Med.*

COUNSEL TO SMOKERS.—The Royal Academy of Belgium gives the following advice to smokers: "Do not use moist tobacco, since nicotin then escapes with the vapor and is not decomposed. Do not smoke either while fasting or a short time before meals. When smoking cigars or cigarets always use an amber, meerschäum, horn or cherry holder. Nicotin vaporizes at 250 degrees, and the portion of it which is not decomposed in the center is attracted toward the tip, and accumulates there; it is, therefore, prudent to throw away the last quarter of a cigar. Do not smoke a pipe which has a short stem. Of all methods of smoking, the cigaret is the least offensive."—*Med. Record*.

ACCIDENTS.—A vulcanizer exploded in a dentist's office at Lowell, Mass., July 17, and wrecked the room, part of the vulcanizer going clear through the ceiling. The same thing occurred August 10 in the office of a dentist at Rahway, N. J. Fortunately the dentist had just left the room. A dentist at York, Pa., was blown ten feet and had his office badly damaged by the explosion of an apparatus for manufacturing vitalized air. A dentist at Marshfield, Wis., was badly burned July 14 by the explosion of an alcohol stove in his laboratory. A gasoline stove exploded in the laboratory of a dentist at Fond du Lac, Wis., and badly injured the dentist. Fire ensued and caused a loss of about \$2,000.

SALE OF DRUGS BY PHYSICIAN.—Section 2620 of the Kentucky statutes makes it a misdemeanor to sell or compound drugs, except for a registered pharmacist, or under his immediate supervision. Section 2632 provides: "Nothing in this act shall apply to or in any manner interfere with the the business of any licensed practicing physician, or prevent him from supplying to his patients such articles as may seem to him proper, or with his compounding his own prescriptions." It will be seen, the Court of Appeals of Kentucky says, in the case of Commonwealth vs. Hovious, that this section does not, simply in general terms, exempt physicians from the provisions of section 2620. The true meaning and intent of section 2632, in the court's opinion, is to allow a physician to compound or sell any kind of drugs to his own patients, but not to fill prescriptions sent to him by others. In other words, if a party applies to a physician for examination and treatment, the physician, the court holds, may furnish him any kind of drugs that in his judgment is proper, or compound for him any kind of

drugs or medicine; but he cannot sell drugs indiscriminately to persons calling for the same, nor compound drugs and sell them indiscriminately to all who may call for them. It results, it holds, that it was error to adjudge not guilty of violating section 2620 a regular licensed physician who carried on the business of a retail druggist in person and by an agent, without obtaining the certificate required by law of pharmacists.—*Jour. A. M. A.*

SKEPTIC CONVERTED.—There is a well-authenticated case, says an exchange, which occurred at Atlantic City some years ago, which shows how powerfully simple things sometimes operate upon the human system. There was a presumptuous young man who ridiculed the homeopathic treatment. A gentleman who heard his gibes undertook to administer a lesson to him. He took several drops of water from the ocean at a spot where a party of young ladies had been bathing, diluted it in a gallon of rainwater and then administered two drops to the skeptic at intervals of one hour. The next day the young man screamed when he saw a mouse, and two days later, the doses being continued, he was knitting a nubia.

THE DOCTOR WHEN HE'S SICK.

I have patched the voice of singers,
And have robbed the sneeze from grip,
Knocked the chills clear out of ague,
Cured the smallpox every trip.
But one stunt has always floored me,
Always will—this little trick—
Giving pills and soft emulsions
To the doctor when he's sick.

—G. T. P., *Chicago Clinic.*

DAMAGE SUITS.—A woman in Philadelphia has sued a "Painless Dental Company" in that town for dislocating her jaw and for swindling her on a guarantee for a set of teeth.—A woman in Chicago has sued a dental parlor for \$10,000, alleging that blood poisoning set in after she had some teeth extracted in the place.—A woman in Terre Haute has sued a dentist in that city for \$10,000 damages, claiming that while extracting a tooth he inoculated her with a loathsome disease, owing to the fact that the forceps were dirty. The dentist's defense is that she had the disease before she came to him, that he refused to work for her on that account, and that she has brought suit to get even.

ANTAGONISM OF MORPHIN AND ATROPIN.—E. Bashford has studied the action of atropin as an antidote to morphin, and arrives at the conclusion that it is difficult to say whether morphin and atropin are mutually antagonistic, that is to say whether morphin could save from death a subject poisoned by atropin, or vice versa. The author experimented on rats, and found that if the minimum lethal dose (determined by experiment) was hypodermically injected from $\frac{1}{1000}$ to $\frac{1}{300}$ of the minimum fatal dose of sulphate of atropin was effectual in averting death. A larger quantity of atropin was not only useless, but sometimes hastened the death of the animal by adding the toxic effect of atropin to that of morphin. Half the minimum lethal dose of morphin is fatal if combined with one-third the poisonous dose

of atropin. If a larger quantity of morphin is administered the effective dose of atropin is greatly limited. The extremely small amount of atropin which can with safety be given in cases of morphin poisoning is the most important fact which observers have established.

SODA FOUNTAIN PARAPHERNALIA of our cities are abominable habitats of disease germs, so slovenly are they utilized by the often uncouth dispensers. Soda water has become such a national beverage that it would seem well-nigh impossible to get along without its soothing effects and the palatable syrups which are nearly always served with it, but it is often the case that the imbibor of a delicious glass of soda takes in so many dangerous microbes with each contraction of the gullet that it would keep him counting all through the succeeding winter to enumerate them all. The remedy is proper cleanliness on the part of those who serve the fountain and handle the drinking glasses, spoons, etc. Every utensil used in common should be sterilized after being used, so that it will be absolutely clean for the next user.—*Pub. Health.*

HIS SENSITIVE NERVES.—It was half an hour past the time for raising the curtain, but the great musician did not appear. At last the manager came to the front of the stage and said: "Ladies and gentlemen, you will pardon this long delay, I am sure, when I explain that Mr. Kabaleffski's nerves have become so greatly overwrought in consequence of the incessant, monotonous motion of the earth from west to east, of which he became suddenly and painfully conscious a short time ago, that at first he refused to make his appearance at all this evening unless the motion could be changed, but in response to our earnest entreaty he has modified this demand, and is engaged in adjusting his nerves to the conditions which, as he sees now, are practically unalterable. With your permission he will complete the process in about fifteen minutes, until the expiration of which time we shall ask your kind indulgence. Thanking you, ladies and gentlemen, for your patience, I will now retire.—*Med. Standard.*

NECROSIS OF THE INFERIOR MAXILLA FROM DENTAL CARIES.—In the *Bulletin Medical* appears a clinic upon necrosis of the lower jaw from dental caries, delivered recently by Professor Broca at the Tenon Hospital. Even in children carious teeth often cause true osteitis of the inferior maxilla. He showed a number of cases to illustrate this condition. One of the early symptoms is earache, worse at night. Later swelling of the gums appears, and it is not generally difficult to find the tooth which is the cause of the condition. In some cases necrosis follows this acute osteitis, with the formation of sequestra, the condition running a subacute or chronic course. In one case a hyperostosis occurred. In all cases the offending teeth must first be extracted, then abscesses are to be evacuated, and packed, if necessary, with dry gauze. Antiseptic washes are advised, the best of which Broca considers to be a 1 per cent solution of chloral, to which a few drops of essence of peppermint have been added. Operative interference is often necessary early in the case. The majority of these cases recover very quickly after the removal of the tooth and the evacuation of the existing abscess.—[M. O.]

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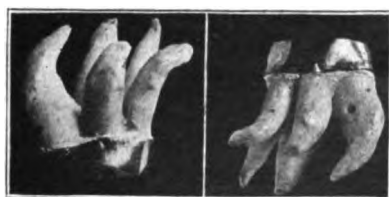
No. 9.

Original Contributions.

FIVE-ROOTED THIRD MOLAR.

BY A. V. TUCKER, D.D.S., NEW YORK CITY.

Some time ago a woman came into my office with a great deal of pain in her jaw and a great lack of money in her pocket. Happening to be in a charitable mood, I extracted the cause of her trouble gratis, and was more than repaid by the possession of a decided curiosity—a left superior third molar with five distinct and well-



developed roots. There was absolutely no possibility of my mistaking the tooth, as the first and second molars—large, strong and perfectly sound teeth—were in position. I experienced considerable difficulty in removing it without breaking any of the roots, as you can readily understand by looking at the tooth. The cuts show views from either side. The crown was entirely gone, and I cemented an old cap on in place of it, so as to have something for the forceps to grasp. I never before saw or heard of a third molar with five distinct roots, so report this case, thinking it may be of interest to the readers of the DIGEST.

REVIEW OF DR. SMITH'S PAPER ON "AN ORIGINAL SYSTEM OF TIGHTENING LOOSE LOWER INCISORS, ETC."

BY OTTO E. INGLIS, D. D. S., PHILADELPHIA.

In the July and August numbers of the DIGEST there appeared a paper by D. D. Smith, D. D. S., in which he took occasion to comment in a manner entirely unwarranted by the facts, and objectionable as well as unprofessional, upon a paper written by myself for the *Stomatologist*. My first impulse upon reading the article was to ignore it, but in consideration of the fact that Dr. Smith at the present time is being much lauded, and that much of what he says is taken for granted, I could but feel that without a protest upon my part his article might be accepted as truth and my silence be misconstrued.

Were Dr. Smith a member of the medical fraternity one could readily understand his "wonder if the general level of teaching in our modern schools is on a plane with the article referred to," but when after various onslaughts he says (p. 546), "The teachings of the profession have been and still are that the application for devitalization must be made directly to the pulp tissue," we can only wonder why he does not say outright, can it be possible that the profession is so lamentably ignorant?

He quotes me correctly on page 540 except for a semicolon and a comma: "These are briefly devitalization by arsenic; benumbing by cocain, cataphoresis or pressure anesthesia, etc." Passing over his cultured use of the semicolon, I wish simply to say that I used the words "cocain cataphoresis" in conjunction.

Dr. Smith ignores (except in a misleading way) the following sentence immediately following the matter quoted: "It is not intended to review the application of these methods, but to compare their advantages and disadvantages in view of work to be accomplished, the time required, and the after-results." Upon this line my paper was written, and I thus explain in order that the slur upon it and myself may be understood as such and in no sense as an apology. I am familiar with all the known methods of pulp removal, and there are several besides those I discussed as being accepted methods. I happened to make mention of the shocking-out method as quoted, and then I added what Dr. Smith omitted

to quote, "Its use has been satisfactory to some, but the slight element of uncertainty in its application, and the production of alarm on the part of the patient, indicate pressure anesthesia as a more reliable method. It has no application to posterior teeth."

Dr. Smith evidently saw an opportunity in this statement and departed from the theme of his article long enough to rap me on the head. He would like to know how the method of shocking-out a pulp with a wooden splint "*removes*" the pulp (p. 541). If he will read Evans' "Crown and Bridgework," 5th edition, 1896, he will find on page 17 the following in regard to the method: "When the wood is withdrawn the pulp usually adheres to it," and again, "In this operation only trifling pain is experienced by the patient, as the pulp is paralyzed by the shock of excision of the crown or by being forced upward toward the foramen and against the walls of the canal." The withdrawal with the stick has been my experience in all the cases I have attempted where a free exposure existed or could be made. I had one failure due to an appearance of wide exposure in a case of oblique fracture of a central incisor. In reality a polypus of the pulp had formed in two days, which I mistook for a simple case of protruding pulp. I shocked with unpleasant consequences, hence my advice to obtain a free exposure.

Dr. Smith asks for experiences of favorable nature, so I offer the following: Year, about 1895. Case, full exposure of a central incisor pulp by caries. Place, Clinic of the P. D. C. Operation, Prof. T. C. Stellwagen drove into the pulp by hand force alone a sharpened Japanese toothpick previously soaked in carbolic acid to make it flexible and sterile. Result, so little pain that for fifteen minutes students examined the case with the toothpick in the root canal, and to each the patient expressed his satisfaction with the operation. The pulp came away *with the stick* upon its removal. The canal was filled as usual and no ill results followed. Another case: Year, 1893. Clinic of Prof. James Garretson. Case, man with upper lateral broken off at the gum line. The pulp was exposed and excruciatingly painful. Prof. G. requested me to give the man relief. I tried analgesics without result. I had no cocain at hand and pressure anesthesia was not then known. There was no cavity in which to retain analgesics or arsenic upon "vital responsively sensitive dentin," so I "refinedly" drove a wooden stick into that sensitive pulp. Now was that not shocking? The pulp died on the instant. I removed it *on the stick* and treated as usual without

ill results. The patient expressed his relief in the most positive terms.

I did not relate these cases in my article in the *Stomatologist* because I supposed *everybody* had read Evans' "Crown and Bridge-work," page 17, in regard to these matters, viz.: The methods of devitalizing previously described are applicable principally to the pulps of incisors and cuspids," and again, page 18, "Practical experience shows that usually instant devitalization or extirpation is the most satisfactory in general and final results."

Dr. Smith would like to know "as to which end, the apical or crown, the wooden splint should be driven in at." I can reply only by saying that I drive wooden sticks into the apical ends of only such individuals as require a renewal of cerebral cortex.

All of these matters I lecture upon, but I presumed in my reader sufficient intelligence to understand the object of my paper without constant reiteration of trite subjects.

Dr. Smith does not like my use of deliquesced zinc chlorid as a styptic, and says it has no styptic action. I use deliquesced zinc chlorid on a cotton twist not only for active apical arterial hemorrhage, but for the serous discharges of an inflamed surface (chronic apical abscess without fistula). In both cases it acts like a charm in promptly checking the discharges of blood or serum, and no ill results accrue as a rule. Occasionally a little tenderness supervenes, but it follows as frequently if not more so in cases of this kind when the drug is not used. The mere sudden removal of the pulp must derange temporarily the apical circulation and aseptic apical pericementitis appears. This is rarely severe and may occur when there is no hemorrhage. The zinc chlorid is probably not in the deliquesced form when it reaches the apical tissues, but an astringent dilution of deliquesced zinc chlorid by the blood fluid. According to the medical dictionaries, a drug which checks hemorrhage by local action is a styptic.

Dr. Smith has turned his imagination loose to conjure up results which have no foundation in fact. I will relate the history of a case which may be of interest in this connection. I was once called upon for an immediate filling of a root and cavity. The patient had to leave the city for six months. I demurred, but the patient insisted in spite of a bad prognosis.

The case was one of a wide open root, with the apical tissue readily accessible, and slight suppuration present. It was prac-

tically a case of apical ulcer. I washed out the pus with hydrogen dioxid, touched the apical tissues with deliquesced zinc chlorid, dried the canal, and filled it with gutta-percha in combination with thick chloro-percha. I filled the cavity, dismissed the patient and set my imagination to work. After six months of sleepless nights I again saw the patient, who reported absolute comfort from date of filling. There is some more partial culture for the "uninitiated."

But Dr. Smith's "main purpose" in the paper, aside from pointing out my shortcomings, is to start arsenic "on a new and enlarged mission for the relief of suffering," which in brief is, "that the arsenic should never be applied directly to the pulp tissue, but always to vital responsively sensitive dentin," the application not to remain over forty-eight to seventy-two hours. Forty-eight hours is to be considered a general limit. He says that it is a "*strictly painless method*" (italics mine). Now a strictly painless method should *never* produce pain, and if that is true, what about the following case? Patient, a lady. Tooth, a right lower molar containing a cavity which when cleansed presented clear, apparently dense, highly vital and responsively sensitive dentin over the pulp. There was no exposure of the pulp, but evidence of hyperemia. Analgesics were applied for twenty-four hours in anticipation of trouble, and then arsenic of about the formula advocated by Dr. Smith was applied to the vital dentin only. Within twenty-four hours a violent reaction took place. The application was removed, the pulp again quieted, and another application made later more to one side of the cavity. Another violent reaction occurred. The final treatment consisted of administering nitrous oxid to the patient and cutting out the bulb of the pulp with a bur. After the recovery of patient and cessation of the hemorrhage, arsenic was applied to the stumps of the pulp and acted like a charm. How would Dr. Smith *always* apply arsenic to vital dentin in cases of semiangrene of the pulp, or ulceration of a canal filament?

Dr. Smith says that "the one retaining material which has proven wholly satisfactory is a white 'temporary stopping.' (Gilbert's red stopping is intensely irritating and should never be used in a tooth.)" We have here a little scapegoat with which Dr. Smith sacrifices his failures. I fail to see how, when an application of arsenic is made to dentin only, Gilbert's red stopping can be more irritating than his white (he makes both varieties). As a matter of fact, no one who knows how to apply arsenic will squeeze any

temporary filling directly upon the application and the pulp. Such action will almost certainly carry the arsenic to the gum tissue, and furthermore, it causes pressure upon the pulp, which will account for the pain. Granting, however, that Dr. Smith obviates the above difficulties by placing cotton or caps as intermediates, which prevent the contact of the temporary stopping with the dentin except at the walls of the cavity, I fail to see how temporary stopping irritates the pulp more quickly than the arsenic, unless the dentinal filaments when irritated react more rapidly upon the pulp than the arsenic can devitalize fibrillæ. The temporary stopping would have to get up a general bulbous hyperemia to accomplish this, for unless carelessly applied the stopping is at a distance from the arsenic and cannot affect the dentin beneath the arsenic except through the medium of the pulp body.

I wish, however, to assert that Gilbert's pink temporary stopping is not irritating to any dentin which will not react to anything placed against it. Gold sometimes causes a severe reaction of the dentinal fibrillæ and pulp when placed in a small cavity. Jack has called attention to this, and states that occasionally the filling must be removed and the cavity carbolized and refilled. I have treated several such by coating the filling with varnish, renewing as necessary for about a week. In all cases so treated the reaction to cold disappeared. After cataphoresis a reaction may occasionally occur, no matter with what the tooth is filled, except when analgesics are employed. Even white gutta-percha will sometimes act as a slight irritant, or call out the reparative efforts of the pulp and fibrillæ, which are beneficial rather than otherwise.

As a proof of the non-irritating character of pink temporary stopping, I offer the following case from my practice. I filled, one afternoon just before one of my lectures, a deep buccal cavity in a left lower third molar with white high-heat gutta-percha. The cavity was thoroughly cleansed of all decay. While finishing up I noticed that fluid appeared at the joint between the filling and the margin, i. e., capillary leakage had occurred in spite of my care. Being in haste to meet my appointment with the class, I left the filling in place, acknowledged the defect to the patient, and made a new appointment. The patient was unable to meet this engagement, and about two weeks passed before I again saw her. She then complained of reaction to cold in both the second and third molars, which after isolation and testing I diagnosed as due to mild

hyperemia of each pulp. That in the third molar I attributed to the irritation of the fibrillæ and pulp by fermenting fluid held in contact with the dentin. That in the second molar I held to be a reflex irritation. I removed the white gutta-percha, sterilized the cavity, carefully dried and rapidly filled it with Gilbert's pink "temporary stopping." The reaction in each tooth gradually ceased in the course of a few days, and I then removed part of the temporary stopping and filled again with gutta-percha. There was no further irritation.

Dr. Flagg taught long ago the use of arsenic applied to vital dentin, but did not prefer it as a system, only as useful when trouble was anticipated. He usually used an analgesic on cotton in connection with the distant application.

I advocated in my paper the removal of an inflamed bulb or its depletion under cocain pressure anesthesia, in order to avoid the preliminary or conjoined use of analgesics. After this depletion devitalization is quite certain as a rule.

The use of arsenic upon a healthy portion of dentin I pointed out in an article in the *Stomatologist* for February, 1897, and stated the rationale of the process. I also emphasized the value of analgesics applied at the same time to the pulp.

Dr. Smith claims that a short application is best, but I do not see how the length of application can affect the result. Indeed, it seems to me that Dr. Smith had better have utilized in review the scientific literature which "would add little to our information" (p. 542). He would have shown by reference to Arkovy (conveniently found in Burchard's "Dental Pathology, Therapeutics and Pharmacology") that arsenic is taken up into the blood ways, and by reference to Flagg, that of a twenty-fifth of a grain applied to a pulp, only about a millionth enters the pulp beyond the immediate vicinity of the point of application, and that none enters the apical tissues, or at least not enough to kill an appreciable amount of tissue, as occurs in the pulp and in the gum. It is impossible that dead pulp tissue should transmit arsenic, and that it does not is proven by the fact that the leaving of arsenic for a long time (several months or a year) is not productive of apical tissue death, nor even of irritation not explainable on the ground of putrefaction.

It follows that such arsenic as enters a pulp must get in before the portion of pulp beneath the application dies. This occurs rapidly, but the action in the root filaments continues for some time. When an application is made to vital and sensitive dentin the

part of the pulp beneath the tubule mouths takes it up and dies first. Dr. Smith says that sometimes a pulp may be *removed* after twenty-four hours, so upon his own clinical evidence the pulp must have been acted upon in such a manner as to get the arsenic clearly beyond all control in a time well within his limits. Any painful reaction is certainly due to the rapid vascular excitement in some part of the pulp. I think I can prove this by a case. A lady had an upper cuspid being overworked by malocclusion, which was in part the cause and the result of a pericemental degeneration and pyorrhea. A plate approximated the tooth, and I desired to retain the root for the sake of the facial expression. I applied arsenic to vital dentin only, and for eight days there was no reaction. On the ninth day pain of a severe gnawing character began and so irritated the lady that she demanded relief. I simply perforated the dentin and entered the pulp with a spear drill. Examination showed the pulp to be about two-thirds dead, the apical portion being sensitive. I applied an analgesic, but left the dead portion of pulp for several days, when I attempted to extirpate but found the apical third still vital.

The following deductions seem rational: 1. It is possible that had I made a short application there would have been no reaction, but that there are no possible means by which this can be determined for this tooth. 2. That what arsenic got into the pulp was insufficient to kill it, although a full dose was applied. 3. That the reaction occurred at a point high up the canal and consisted of a vital reaction against some irritant. 4. That as a part of the pulp was dead and so unable to transmit arsenic, that irritant was the arsenic already in the pulp next to the living filament or the dead tissue itself. 5. As the arsenic did not subsequently particularly affect the living portion after the congestion was relieved by puncture with a drill at a point distant from the reacting tissue, it is reasonable to suppose that the pulp died progressively by reason of a hyperemia which interfered with its nutrition, and that when a drain was established by puncture the living tissue could not become congested. Had there been arsenic in appreciable amount in the dead portion of the pulp, it would have killed the living part, as gum tissue is killed, even after a drain was established.

It has not been my experience that applications to dentin or pulp are either universally painless or painful, or that applications to any part are of any use in severe bulbous hyperemia until depletion

is practised. In localized inflammation of a pulp horn a distant application combined with analgesics at the horn is advisable, as I have previously pointed out, but that it is possible to deplete freely and then make a painless application *to the pulp* I have shown.

Dr. Smith seems to have seized upon an idea practically already proven to be good, and made the welkin ring with his "I always do it." As cases cited and questions asked show, it cannot *always* be done.

Dr. Smith takes me up on the "patients of a type to resist arsenic," and immediately says that "investigation will show such cases to be in connection with vigorous active pulps in strong dense teeth." I agree with Dr. Smith in his observation, and the types of patients who possess such teeth are the ones referred to.

Dr. Smith has found so large a mote in my eye that he has overlooked the beam in his own; indeed, it seems to have rendered him extremely myopic. Let us examine a few of his statements in the light of the present state of dental science. On page 536 he says: "The crude mechanical attempts which have been made with strings and wire in an effort to stay this loosening have contributed greatly to the general infection of the mouth and served to hasten the inevitable issue." And again, "We fail to note a suggestion even looking to a cure." Strings and wire! Can it be that this is the "baby" he has engaged to "knock down?" Has he overlooked the several neat if showy devices for the banding, splinting, etc., of the teeth? It would seem that he does not possess or has not read Evans' "Crown and Bridgework," or paid attention to devices which have been presented from time to time of much greater merit than strings and wire.

Evans in his fifth edition, Fig. 358, illustrates a device for banding lower incisors and, if need be, soldering in an artificial incisor or two. He also shows in Figs. 334-5-6 Litch's pin-bridge for vital teeth, differing from Smith's device only in the matter of pins and the object for which it is constructed. Burchard in his work on pathology illustrates two methods of splinting loose lower incisors.

Dr. W. H. Trueman in or about 1894 introduced a device consisting, in brief, of a bar adapted to the lingual surfaces of the tips of the lower incisors. To this were fastened portions of screw-threaded wire to enter holes drilled in the incisors from the labial

to the lingual side at a safe distance from the pulp and cutting edge. The exact method in detail may be found in *Cosmos*, and Dr. Trueman has now had eight years' satisfactory use of it.

Dr. L. C. Bryan of Basle, Switzerland, introduced in 1898 a continuous pure-gold band, perhaps three-sixteenths of an inch wide, to encircle say three or four lower incisors. This was adapted to the necks and pressed into all interspaces to meet the opposing part of the band. When adapted the band was sprung off and finished up, rubber dam applied, and cement placed in the band and about the necks of the teeth. The band was then readapted to the teeth and secured by means of pure gold clamps. Dr. Bryan said that an appliance placed four years before had cured a case of pyorrhea, and that the tissues were healthy up to date of writing. I have used this device since 1899 and like it.

I do not intend to discuss further the merits of these forms of retaining apparatus, nor of small bars with clasps attached, nor of wires fitted into incisal edges when these are broad, but my present point is to show that Dr. Smith's device, while possessing good points and indefatigably pushed, is but a step removed from other devices and by no means such an advance upon the present resources of the dead level of dentistry as his "strings and wire" comparison would indicate. Whether it is an advance at all only time can tell. We are forced to conclude that Dr. Smith either does not know of these devices or chooses to refuse to credit them as offering any suggestion in his work. At any rate, he has ignored them in his presentation.

Dr. Smith devotes much space to proving that a pulpless tooth is not a dead tooth, but refrains from quoting Flagg, in the little quiz book referred to, who asserted the same fact, with which everybody is familiar. He says in four breaths, p. 538, "There is not only no injury to the root in a wisely directed devitalization, but there is considerable gain," and "physiologically the cementum receives its life and nutrition from a source wholly independent of the pulp, and it is unaffected by devitalization of pulp tissue." And p. 539, "for the root portion of the tooth, in connection with its pericementum, is an independent vital organ retaining and exercising function the same as when *the pulp distributed nutrition and sensation to the dentin and enamel of the crown*" (italics mine), and "a noticeably frequent result of pulp destruction is a closer, firmer union of root and alveolus. This is probably due to two

causes: First, an increased tendency to a deposit of cemental tissue on the surface of the root, and second, the entire obliteration of calcific deposits in cementum through pulp influence."

I fail to see how a cementum with its pericementum can be independent of pulp action and unaffected by the devitalization of pulp tissue on the one hand, and yet there be a considerable gain by killing the pulp wisely. Granting the possibility of hypercementosis as a result of devitalization, I fail to see how the gain is made by the entire obliteration of calcific deposits in cementum through the influence of a pulp that has been wisely killed. Does Dr. Smith mean by calcific deposits in cementum a lessening in calibre of the lacunæ and canaliculi at the expense of their contents? If so, how can devitalization, which is expected to bring about the deposit of new cemental tissue, accomplish their elimination? If he means that deposits of calculi *in the pericementum* and *on* the cementum are directly due to pulp influence, I fail to see how a dead pulp can obliterate them, and he offers no proof that anything ever obliterates them or that they are present in the cases of which his article treats.

Our knowledge of such deposits is altogether due to such cases as come to our attention in the so-called gouty pericementitis, and when these are found to be in relation with a deposit the case is not ordinarily cured until the calculus is mechanically removed. In the case of loosening of lower incisors the calculus is deposited from the saliva and the pulp has little to do with the matter, except perhaps to be reflexly or mechanically irritated.

The crowning statement of Dr. Smith's paper is the one made on p. 537. In it the lower stratum of dentists is informed of wonderful things in dental embryology. Dr. Smith says: "Turning first to the living pulp, its work, as builder and nourisher of dentin (whether of root or crown) and of all enamel, is beyond dispute or question. The pulp is the only source of nutrition or sensation distributed to dentin or enamel in any part of the tooth; it also binds the dentin and enamel into sentient and nutritive agreement, through that vital force we call life." This is stated repeatedly, so there is no mistake of "terms, means or methods."

In the American System of Dentistry (1884), a chapter in which Dr. Smith wrote, Dr. Sudduth taught that the enamel is formed by the ameloblasts, specialized columnar cells upon the under

surface of the enamel organ, and that the latter is of epithelial origin.

Dr. Williams about six years ago demonstrated by photomicrographs that this process was correctly described by Sudduth, and he showed the peculiar structure of enamel, its globules and interprismatic cement substance. He also offered proofs that the two substances are deposited more or less simultaneously by the ameloblasts upon dentin *first* and afterward upon previously formed enamel, and so on until the outer form of the crown is complete. The ameloblasts were shown to constantly recede from the dentin and pulp as this enamel is deposited. As the pulp builds dentin it recedes from the neighborhood of the enamel, until finally it occupies a typical pulp cavity. Dr. Smith should read Andrews in the "American Text-book of Operative Dentistry" on this subject.

The nutrition of enamel by the pulp is a very questionable point. Williams showed that no stain used by histologists has any effect on enamel, and he concluded that it was without nutrient spaces. Sudduth regarded it as merely a "coat of mail," and Tomes has shown that it has little organic matter but is a fully crystallized mass.

Dr. Smith bases the apparent change of appearance in teeth treated by his prophylactic system upon this imaginary nutrition. White spots are said to disappear, etc., because of it. As a matter of fact, the appearance may be largely attributed to either a change in the dentin shown through translucent enamel or to the lapidary effects of daily and monthly polishing. The polished top of a marble slab appears to differ in color and texture from the bottom, but drop a little sulfuric acid upon each and their natures are seen to be identical.

My daughter, aged fourteen, has a small white spot or developmental defect upon the labial surface of a central near the incisal edge. This is a spot that has been subjected to constant friction for *eight years*. It has not changed in appearance in the slightest degree. The incisal edges of her teeth were almost transparent, but are now partly worn. It is quite possible that white spots made by acid action may be mechanically removed by the daily powder and monthly pumice friction, but that is not due to enamel nutrition.

Dr. Smith claims that the pulp furnishes sensation to the enamel. The idea is certainly a new one and springs Minerva-like from the

forehead of Jupiter. Dental histologists will be extremely obliged to Dr. Smith for his valuable and unquestionable contributions.

"These quotations from this recent article are but samples of the incongruous absurdities put forth as the teachings of dentistry," and come from the pen of one who has been said to be "considered by many to be one of the best dentists not only in Philadelphia, but in the country."

In conclusion, I wish to say that I would much rather not have been compelled to write this review, and I wish also to state that I believe that there are good points in Dr. Smith's work for which he is entitled to credit, but I like neither his science nor his mode of attack. Feeling that I have been forced to reply, I have gone at it a la Polonius.

PRESIDENT'S ANNUAL ADDRESS.

BY M. L. HANAFORD, D.D.S., ROCKFORD, ILL. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

It is said that "well begun is half done." In making my beginning I shall profit by the example of the good colored preacher who, on being asked the secret of his ability to give such powerful sermons, replied, "Well, you see, when I get up to preach I say, 'Brethren, remember three things;' and then I set to work to think *what* three things there are to remember." I feel sure there must be "three things" for us to remember—let us see if we can find them. First, let us remember that the past year has been one of prosperity in the business world, and that dentistry has partaken of that prosperity, for scientific dentistry may await in vain its opportunity if the people who need its service have not the wherewithal to give it employment. We sometimes deceive ourselves into thinking that our services are in the class with so-called necessities. They may be to a limited extent, but from the treatment of toothache or the making of plain fillings and rubber dentures, it is a far cry to extensive gold or porcelain restorations, crowns, bridges and continuous gum. These latter may for many of us lie on the shelf covered with metaphorical dust and cobwebs, until the time of general prosperity, when the people have leisure and means to get a little away from the bare bread and butter idea. We in the last few years have felt the stimu-

lus of "easy times," and the result has been a getting out of the ruts, and the acceptance and practice of advanced ideas and methods by the average dentist. And remember, it is the work of the *average* dentist which makes for the professional and business welfare of all—high or low.

Let us remember that during the past year the methods of our state board have been reviewed and corrected; that the personnel of the board has been changed so that we need no longer blush at the bare mention of that body or its official acts. But let us also remember that our dental law is one of the poorest—that not only are we behind other states in this, but we are behind the medical profession in our own state. Why should all applicants for license to practice medicine be required to pass examination, irrespective of the fact of graduation from medical colleges, any more than candidates for the practice of dentistry? Are medical colleges more remiss in their duties than dental colleges? Doubtless all graduates from dental colleges *ought* to be well qualified to practice dentistry, but we know they are not. Those who are qualified certainly would not fear such an examination, and the state board would be relieved from the troublesome question as to the "reputability" of colleges. No worthy man could possibly suffer, and, in my judgment, the general good could not fail to be greatly advanced by such a requirement.

Let us remember that we are a great and strong society. Perhaps there is little danger of our forgetting this, having been told it annually for at least twenty-five years. Let us rather remember that since we are a great and strong society, much is required of us. Our meetings have ever been inspiring and helpful to every member of our profession, and indirectly to every citizen in this great commonwealth. Let the younger members in different and perhaps distant parts of the state, who may be somewhat doubtful as to whether it will "pay" to attend meetings year after year, remember the many men as great and learned as themselves, who have said truthfully and feelingly, "All that I am I owe to this society." In the year 1883, when this society endeavored to show its love for our honored nestor, Dr. Black, by presenting him with a small token of its esteem, he said among other things—"Gentlemen, I personally owe this society much more than it owes me. Whatever I may be to-day in our profession, whatever I may be as a student, whatever my capabilities may be for good; I owe it more to this society than to any other one instrumentality. You have done more for me than I have

done for you." In view of such an acknowledgment it ill becomes any of us to make light of the advantages which we enjoy to-day.

But while appreciating fully all these facts, we are not to plume ourselves too much on our past record. Times and circumstances change. District and local societies have sprung up all over the state, and they are now doing much of the work which formerly had to be done by the state society. Our work should correspond with the dignity commensurate with our age, which means that it should be scientific, well considered, mature. I hear someone object that this would lead to the presentation of too many papers treating of theoretical or so-called scientific subjects; but let that one remember that nothing is truly practical which is not based upon correct theory. What could be more practical than the work of Dr. Black in the study of caries fungus, and of Dr. Andrews in showing on the screen the actual penetration of the enamel and dentin by this fungus, followed in due time by the discovery and demonstration of the microbic plaque of Williams? Conceived as a theory, the origin of caries of the teeth in an acid-producing fungus becomes an established, demonstrable fact, and every intelligent dentist who fills teeth to-day owes a debt which he can never pay to the men who gave him first a theory and then a scientific demonstration. As has been said, the smaller and local societies can do much of the elementary work which needs to be done; and because they are doing that work well, it would seem to be good sense that our programs should include even more material of a scientific nature than formerly, and less of an elementary character. It would also seem that there might be a measure of unity as to the subjects presented—a key-note which should dominate as a leading idea the work of the society during the meeting.

This is offered in no spirit of criticism of former programs, which have doubtless reflected the desires and needs of the membership, but with the idea of calling attention to the fact that although great, we are not as great as we should be.

Discussion. *Dr. C. P. Pruyn*, Chicago: Perhaps we don't fully appreciate the blessings that this society confers upon us, but we are told by men who visit other large societies that this is the best in the country. One evening in 1876, after attending the Chicago Dental Society, Dr. A. B. Clark and I were walked about the streets by Dr. Joshua Smith and bulldozed into joining this society. I have always felt under great obligation to Dr. Smith, and if some of us

would do a little bulldozing among those who are not members of the society we would be conferring a great favor on them. I cannot help thinking of Drs. Cushing, Swain and Dean, as well as many other men who helped to make this society what it is, and who always made me welcome. When you see a young man here, don't hesitate to make him feel at home, for the treatment he receives at the first meeting or two may decide his future.

Prof. Allen, in Rush Medical College, used to say: "In diagnosis always remember these three: first, the condition of the part; second, the condition of the blood, and third, the condition of the nervous system. If we as dentists should remember these three things we would practice our profession in a more intelligent manner. When I joined this society one of the dominant thoughts was pulp-capping, and as we were doing it without "these three," we had no end of failures. Nowadays when we cap pulps we do it with a knowledge of the environments.

Everyone is ashamed of our state dental law, and if we ever have a better one it must come through the efforts of this society. We now have a good state board and we ought to give them a good law to work under.

Dr. J. N. Crouse, Chicago: What's the matter with the law? The attorney general tells me we have a very good one, but the trouble is that it hasn't been enforced. The board has absolute power to carry out the law, and I have no doubt will do so. We would better leave the law just as it is, for by changing we are likely to get a worse one.

Dr. J. G. Reid, Chicago: We have probably as good a law as there is in the United States, but the fact is that we have never known until now just how far we could go and what we could do. Recently, however, the attorney general of the state has given some opinions and construed the law, so that we know where we stand. I will distribute to all present a copy of the new rules and regulations, which I hope will be read. The Board has spent considerable time in collecting this matter, which fact I mention in passing simply to let you know that the board is not idle, but is composed of men who have an interest in the profession and the public.

There is one point in the law that could be materially improved, namely, make the state society sponsor for all who shall be appointed as members of the board. This being a representative organization of the profession in the state is better qualified to select the proper material for the Board than outsiders who know nothing of the men.

Dr. G. V. Black, Chicago: If the attorney general's interpretation stands our law is a good one and we need not trouble ourselves at present about any modification of it, but as many men will be denied examination under these new rulings, it is very probable that the law will be tested in the courts. The rulings of the courts in various states during the year past have been such as to place the interpretation of laws and the making of rules in the hands of the boards. The courts recognize the advancement that is taking place in this and other professions, and seem to consider it not only the right but the duty of the boards to advance their rulings to meet the advancement in education among the profession and the people. For instance, if the law states that a student must take a course of two years in college before beginning practice, and the dental education is advanced to three years, it is held to be the duty of the board to enforce the three years, regardless of the law. In this way the board becomes the interpreter of the necessities of the profession and of the people. It must feel the pulse of advancement in education and keep up with it.

Dr. Don M. Gallie, Chicago: I think Dr. Crouse has sounded the right key—the law is all right, but it has not been enforced. The less we tamper with it the better results we shall get, especially if the dentists support it. One thing the dentists of this state must remember is, that according to the recent ruling of the attorney general the state board is not permitted to have its own attorneys, as a state's attorney must prosecute these illegal practitioners. The Board can't do it, for besides the ruling, it hasn't the money. Any dentist who has to compete with an illegal practitioner should prosecute him.

Dr. C. R. Taylor, Streator, Ill.: I wish to recur to the point made about the attendance at our state society. If we would accomplish what we owe to ourselves and the people in the communities in which we live, we must get that missionary spirit in our hearts and teach our confreres that it pays to attend the meetings of the state society. I am proud to say that every dentist in the town of Streator, excepting one who is unethical in practice, will be here.

Dr. Hanaford, closing discussion: It does seem as if these two defects in the board might be remedied, first, the fact that the appointment of members is in the hands of politicians, and, second, that there is no provision for sufficient funds.

ART AND INVENTION, REPORT OF THE COMMITTEE.

BY HART J. GOSLEE, D.D.S., CHICAGO. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

While the progress of dental art and invention is coextensive with the advancement of dentistry, this particular field has been perhaps less active than usual during the past year, yet many new and more or less ingenious and useful appliances have been devised. The records show that something less than one hundred patents have been issued, covering various kinds of dental appurtenances, with a range of application and usefulness extending from a chair and parts to be affixed thereto to broaches, floss-silk holders, and tooth-brushes, and including remedies for the cure of pyorrhea alveolaris and agents for mummifying pulps.

The patentees of those which were deemed to be of sufficient general interest and importance were communicated with, and the presentation of new instruments, materials and ideas was solicited through the various journals and from all of the leading manufacturers. Irrespective of the accompanying announcement that the privilege of rejecting any and criticising all had been reserved, the communication met with the usual prompt response. The exercise of such a prerogative as this has become necessary, in order to prevent the usurpation of the function and usefulness of this committee, as well as the time and privileges of the general body, and with a fair and impartial consideration of all articles submitted the following have been selected for presentation:

1. *Riveting Forceps*.—A pair of forceps designed for the purpose of riveting the projecting ends of the pins to the backing in replacing broken facings in crown and bridgework. This instrument is nicely made; one beak presents a cushion of corrugated rubber, with a swivel joint, which admits of its adjustment to the porcelain at any angle and precludes fracturing it, and the other beak, also adjustable, presents a slight concavity for the enlargement of the end of the platinum pin by compressing it. In its use, if the facing is ground to fit the backing, and the pins are allowed to project through it about 1-32 of an inch, the attachment may be firmly secured by giving the arm a slight rotary motion while compressing the handles. The ease and facility with which facings may be thus securely attached, and the simplicity of the procedure, will at once recommend this as being a most useful device.

2. *Elevator Points and Handpiece*.—This exhibit consists of the models of seven elevator points, adjustable to a handpiece, which serves also as a holder for those not in use. With the exception of one which is a modification of the original design of Dr. Geo. Watt, they are constructed upon new and somewhat original lines, which, together with their compact form, strength, and variety of design, gives them a wide range of application and usefulness.

3. *Ligature Adjuster*.—This comprises a pair of double-end instruments, designed for the purpose of facilitating the adjustment of a ligature to the neck of the tooth, and pushing it within the free margin of the gum, for which their form and shape make them conveniently useful. The above selections are the product of the genius of Dr. Frank Brewer, Sr., of King City, Cal.

4. *Perfection Boltless Flask*.—This is an adjustable boltless flask, with bench plate and hand wrench. The principle upon which it is constructed, which consists of a threaded base and outer cylinder, admits of a ready adjustment of the two central parts of the flask when molding the vulcanite, but the small dimensions of the latter is an objectionable feature in an otherwise useful device.

5. *New Bull-Dog Forceps*.—This set of forceps, which are illustrated by drawings only, is of unique design. The beaks are short and heavy, and are supported by a supplementary or double hinge which is intended to increase the purchase upon a tooth with less effort on the part of the operator. Their usefulness, however, could not well be prophesied without testing their practical application. These two designs are the invention of Dr. Frank Brewer, Jr., of Watsonville, California.

6. *Automatic Orthodontia Soldering Clamps*.—These comprise a set of five clamps, designed to automatically hold the various parts of a regulating appliance in apposition while soldering. They are small, splendidly made, and are composed of an alloy which absorbs but little heat, which, together with the variety of form of points, makes them a most useful and convenient set of appliances for this purpose. Designed by Dr. H. A. Pullen of Buffalo, N. Y., and manufactured by the Buffalo Dental Manufacturing Company.

7. *Matrix Clamps*.—A set of two clamps and matrices, designed by Dr. R. B. Power of Green Bay, Wis. The matrices are made of thin, well-annealed German silver, with perforations which engage the points of the clamps. The latter are universally applicable, are

easily adjusted, and hold the matrix securely to the tooth, which makes them appear particularly useful.

8. *High-Fusing Oil Colors*.—These are a mineral paint, prepared in six basal colors, to meet the demands of the more artistically inclined practitioners. Their use admits of obtaining almost any desired shade or variation in a facing or inlay, as well as to more perfectly imitate the characteristics of the natural teeth. Manufactured by Mr. Robert Brewster of Chicago.

9. *Kerr's Anatomical Articulator*.—An improved anatomical articulator, designed by Mr. M. M. Kerr, of the Detroit Dental Manufacturing Company, at the suggestion of Dr. B. J. Cigrand of Chicago. This articulator presents features which seem to afford opportunities for a more perfect, accurate and scientific mechanical reproduction of the various movements of the lower jaw than any other. If models are properly mounted, they may be so placed as to bring the occlusal plane of the bicuspid and molars on a line with the hinge; the movements are easily adjustable to the requirements of the individual case; the parts are stiff enough to be rigid, and a full view of the lingual aspect of the teeth in arranging them is not obstructed; all of which are eminently desirable features.

10. *Converse Angular Beak Forceps*.—These comprise a complete set of forceps, prepared with converse angular beaks, which, because of their divergent lines of contact on either side of the tooth, increase the area gripped by the forceps, and no doubt lessen the danger of fracture. They are the invention of Dr. G. L. Bennett of Chicago, a member of this society.

11. *Fountain Tooth Spray*.—This hygienic apparatus consists of a bulb with multiperforated point, designed for the purpose of flushing the gums and irrigating the teeth with water or any antiseptic mouth wash, and may also be useful as a chip-blower. It is the product of the fertile genius of Dr. J. H. Woolley of Chicago.

12. *Partial Impression Tray*.—The difficulty of removing partial impressions taken in plaster may be overcome by the use of this style of tray. It consists of two small inner portions, with the dividing line in the center, and upon the removal of the outer tray the line of fracture is easily made by separating the remaining ones with the point of a small knife-blade, thus admitting of an accurate impression of the most difficult cases. Designed by Dr. E. L. Townsend of Los Angeles, Cal.

13. *Adjustable Bite Tray*.—This device consists of a flat, adjust-

able tray, designed to serve the purpose of unyielding base plates in taking the bite. While it answers this purpose and sustains the relation of the imprint of the jaws while removing from the mouth, the use of any such means for accomplishing this important procedure is objectionable, because no opportunity is afforded for observing the proper relations, for obtaining the desired restoration of contour, or for obviating the resistance offered by the wax to the normal closure of the jaw. Designed by Dr. T. F. Driskill of Corsicana, Texas.

14. *Antiseptic Floss Holder*.—The model of this little device is presented by Dr. J. W. Cowan of Geneseo, N. Y., and is a more simple and somewhat modified edition of his former design. It consists of a cartridge of antiseptically treated waxed floss silk, which fits into a recessed chamber to which a clamp and spring bow, provided with a spring hook on the outer end, are attached. The silk being drawn out of the cartridge as required for use is secured between the clamp and the hook, thus providing a taut section of floss. The operative part of the device telescopes into a tubular case much like the fountain pen, and is reversible, so that when in use the casing forms a handle, and a cover when in the pocket. A convenient cutter to sever the silk is also provided. When the floss is exhausted, the empty cartridge is discarded and a fresh one substituted. The device is made of nickeled metal and aluminum, and is about the same size and form as a small penknife.

15. *Plastic Spatula*.—A flexible spatula to be used in modeling plastic fillings, which seems to be especially adapted to approximal cavities on the distal surfaces of posterior teeth. Designed by Dr. B. L. Thorpe of St. Louis.

16. *Scott's Seamless Crown Outfit*.—The enthusiastic advocates of seamless crowns have no end of methods from which to choose, and yet will probably be interested in the device designed by Dr. W. P. Scott of Chicago for constructing crowns by this method. The apparatus consists of a tapering cylinder and plunger, and the crown is swaged over a metal reproduction of the desired form, by surrounding it with a lead matrix and driving the whole down into the cylinder, which compresses the gold instead of expanding it.

17. *Adamson's Seamless Crown Outfit*.—This device is very similar in principle to the former one, and differs only in that the swaging is done by surrounding the crown with fine shot instead of the previously cast lead matrix, and driving them down into the

tapering cylinder. Presented by Dr. C. W. Adamson of New York.

So many different apparatuses for constructing this style of crown are being constantly introduced, that it is difficult to ascertain which are the most useful, hence this will be left an open question to be settled by those who believe in the manufacturer's modest claim for the paramount advantages for his method.

18. *Universal Porcelain Instrument*.—This is designed for general use in the manipulation of porcelain, and is intended to embody all of the combined requirements of an instrument for the same. It comprises a spatula for mixing, a suitable point for carving, and a roughly serrated shank for packing the body. Designed by Dr. Hart J. Goslee of Chicago.

19. *Dunn's Combination Clamp*.—This clamp is designed as a quick separator for spacing the anterior teeth, for filling, finishing, for examinations, and to take the place of wedges, and at the same time to answer as a rubber-dam clamp. If the bow is in the way on one side, it can be easily and quickly changed to the opposite side. Designed by Dr. J. Austin Dunn of Chicago.

20. *Dunn's Combination Bottle*.—Designed for holding, preserving and dispensing medicaments from the original bottle, without danger of contamination. This bulb has a diaphragm or valve near its outlet end, which keeps the medicament from entering the bulb, and at the same time acts as a perfect cork. Designed by Dr. J. Austin Dunn of Chicago.

The following articles are submitted by the S. S. White Dental Mfg. Co.:

21. *Sadelia Operating Stool*.—This is the design of Dr. Geo. H. Chance of Portland, Oregon, and because of its peculiar shape is especially adapted to the human anatomy. By thus affording a support to the base of the spinal column, a sitting position may be maintained while operating, which is a desirable feature.

22. *High-Fusing Porcelain for Inlay Work*.—Consisting of twelve bottles of various colors of body and a shade guide to match, a double-end carving tool, a pair of locking tweezers, a pipet bottle and spatula; the whole in a neat oak case. While the grade of body combines the requirements of strength, stability of form and translucency, the range of colors is inadequate for general use, unless one is expert enough to obtain a greater range by blending the basal shades.

22a. *High-Fusing Porcelain for Crown and Bridgework*.—This

outfit is similar in all respects to that for inlay work, except that the body is not ground quite so fine, and is therefore higher fusing, and that the increased number of colors to twenty-five includes a range which makes them more generally useful.

23. *Tweezers for Porcelain*.—Spring-tempered tweezers, with a sliding lock pin in a slot, for handling inlays or crowns, or for holding bands.

24. *Arkansas Points for Inlay Work*.—A set of six Arkansas stone points, designed by Dr. N. S. Jenkins, for polishing cavity margins for porcelain inlays. They leave a perfectly smooth surface, so that the matrix is not so likely to be torn when being withdrawn from the cavity.

25. *Knapp's Detachable Band Stud*.—An additional and very useful regulating device, enabling the operator to use any tooth band, and to attach the usual regulating appliances at any point where the band can be perforated.

26. *Knapp's Head Cap*.—A very neat contrivance of kangaroo skin and silk cord, light, cool and adjustable, and fitted with metal buttons for the attachment of rubber bands with the protrusion bow.

27. *Water Syringe No. 36*.—The pipe in this syringe is curved and fitted with a metal plate, and fills the bulb automatically when hung over the edge of a glass filled with water. By holding in the hollow of the left hand when grinding teeth the thumb and forefinger can be used for keeping the patient's mouth open, the syringe responding to the slightest pressure of the bulb.

28. *Gritman's Band and Crown Drivers*.—A set of four cone-socket instruments—(1) To hold a wooden point for fitting bands or setting hollow metal crowns. (2) For fitting bands for dowel crowns on anterior teeth. (3) Of bayonet shape for fitting bands to posterior teeth. (4) A bayonet-shaped driver, 3-16 inch wide, to enable the operator to reach any point of the band he wishes to drive into position. The usefulness of any instrument designed to *drive* a band to position on the root is questionable, however, when the same result can be accomplished with equal facility and much more comfort by gently pressing it to place with the flat, smooth edge of a piece of soft wood, held at right angles.

29. *Diamond Burs*.—A set of sixteen instruments, with soft steel heads, into which fine diamond dust has been incorporated. If run rapidly, and the points kept well moistened, they will be found very desirable in giving a smooth edge when finishing up cavities.

30. *Card System of Account Keeping*.—The outfit consists of three sets of guide cards, each set having a distinct color—300 white record cards, and a pad of examination blanks, inclosed in a Japanned tin or oak case. This method facilitates the rendering of bills, all paid and closed accounts being eliminated, and does entirely away with books.

31. *Contra-Angle Handpieces*.—The improved feature in these handpieces is the bend or elbow in the handle, which disposes the angular head to one side of the axis of the handpiece. This permits the head of bur, when placed in position, to be approximately in line with the axis of the handpiece, which construction avoids any tendency of the handpiece to turn in the hand or rock laterally when cutting out buccal or lingual grooves of cavities.

32. *Nose Cup*.—A glass cup, three inches by one and three-quarters inches in diameter, affording a gentle but effective means of irrigating the naso-pharyngeal tract.

33. *Gem Cavity Trimmers*.—A set of five small mounted gem points, especially adapted for cutting away overhanging enamel in the preparation of cavities. As the points wear from use they can be used in smaller cavities, and will cut until almost worn down to the mandrel. Can be used wet or dry.

34. *Vulcanite Trimmers*.—A set of three bayonet-shaped vulcanite chisels, about four inches in length, one with square edge and two with oblique edges, admirably adapted for accurate trimming up of vulcanite dentures, especially in the interstices; the short broad-based handle fits snugly in the palm of the hand, and is flattened on one side to prevent rolling.

35. *Peeso's Ladle for Fusible Alloys*.—A very convenient ladle for melting and pouring fusible alloys. Designed by Dr. F. A. Peeso of Philadelphia.

In conclusion, the committee desires to extend thanks to the various exhibitors for their courtesy, and particularly to the S. S. White Dental Mfg. Co. an expression of appreciation for mounting the exhibit in this most excellent manner.

Discussion. *Dr. E. H. Allen*, Freeport, Ill.: I am a little surprised that the S. S. White Dental Mfg. Co. should place before the dental profession to-day a system of keeping accounts, as they claim at the suggestion of Dr. S. H. Guilford, when the system is without doubt a copy of the Triggs' system, which was on the market long before the White Co. put theirs out.

COMPARATIVE STUDY OF THE ATTACHMENT OF
THE TEETH.

BY F. B. NOYES, D.D.S., CHICAGO. READ BEFORE SECTION ON STOMATOLOGY, AMERICAN MEDICAL ASSOCIATION, JUNE 10-13, 1902.

That the teeth are not a part of the osseous system, but are appendages of the skin, supported in man by a special development of bone forming the alveolar ridges of the maxillary bones, is as well established as any fact concerning human dentition. The work of Oscar Hertwig, published in 1874, established very clearly the homology existing between the teeth and the dermal or placoid scales of the ganoid, silurioid, and dipnoan fishes, both as to similarity of structure and development.

Much has been written descriptive of the teeth of various animals, their modifications of form, and attachment to adapt them to modifications of function, and various classifications of the means of attachment have been made. Of these, perhaps the best and most logical is given by Charles Tomes in his "Dental Anatomy," describing four forms of attachment—1, by fibrous membrane; 2, by hinge-joint; 3, by ankylosis; 4, by insertion in a socket.

I wish simply to take up these various form of attachment, and show, if possible, the comparison between them and the evolution of the more complicated forms from the simpler. We must begin with an examination of the structure and attachment of the placoid scales and the simplest form of tooth, as illustrated in the shark. The dermal scales are composed of a conical cap of calcified tissue developed from within outward, by an epithelial organ, and corresponding in structure to the enamel. This cap is supported upon a conical papilla of calcified tissue formed from without inward, and corresponding to dentin. In the outer layer the arrangement of the fine tubules through the calcified matrix corresponds very closely to human dentin, but in the inner portions it is to be understood only by considering the formation of the dentin as progressing irregularly over the surface of the pulp and so dividing the pulp tissue into portions inclosed in large canals, from which the fine tubules radiate. The base of this partially calcified papilla has a calcified connective tissue built onto it by the derma, which corresponds to cementum forming the basal plate, spreading out more or less in the connective-tissue layer of the

skin, and into which the fibers of this layer are built, so attaching the denticle or dermal scale to the deep layer of the coreum. This tissue very exactly resembles cementum. It is formed on the dentin as the cementum of a human tooth is, and shows the connective-tissue fibers embedded in it. In the ganoids the basal plates of adjoining scales unite, forming the armor plates of such fish as the sturgeon and gar-pike, and the dentical remains projecting from the surface of the plates.

In the simplest teeth, as of the shark lamna, which are typical dermal scales, we have an exactly similar method of attachment, which may be taken as the simplest and most rudimentary, or attachment in a fibrous membrane. That is, there is no development or modification of the arch of the jaw, and the teeth have no direct attachment to the bone; in fact, the jaws themselves are chiefly cartilage.

The formation of the hinge attachment as illustrated in many of the fishes may be understood as a modification of the attachment in a fibrous membrane in a more highly specialized creature. These hinged teeth are found in many fishes and in the poison-fangs of snakes. The jaws are calcified, and the basal plate or cementum may be considered as confined to, or specially developed on, one side of the dentin papilla, which is also more highly developed, especially in snakes. This cementum is built and calcified around the fibers of the fibrous tissue which pass directly to the bone of the jaw at that point. This bone is to be regarded as an addition to the jaw specially developed for each tooth. We have then not only a modification in the arrangement of the cementum, but a development of bone for attachment of the tooth. The blood-vessels pass through the fibers of the hinge to the pulp, and are not affected by the motion of the tooth on the hinge; in fact, the pulp seems to be attached to the hinge. There are many complications of this method of attachment, but this may be taken as the type and the manner of its modification from the rudimentary conditions. The distinction, in this form of attachment, from the dermal scale consists in a modification of the arrangement of the cementum of the basal plate and a development of bone from the jaw to attach fibers which pass from cementum to bone directly. It should also be said that there are developments in the hinge teeth related to the third form of attachment, namely, ankylosis, which cannot be understood until this form is studied.

The third form of attachment, ankylosis, or direct calcified union with the bone of the jaw, cannot be understood without a careful study of the nature and formation of the dentin in these rudimentary teeth. It is evident, from a study of the dentin of the dermal scales, that compared with human dentin the tissue is rudimentary and not differentiated from other similar connective tissues. The tubules are comparatively very irregular, and resemble strikingly the tubules found in the secondary dentin formed by a degenerating pulp. The odontoblasts, or dentin-forming cells, are not like the highly specialized cell which form the primary human dentin, but resemble very closely simple spindle-shaped connective-tissue cells; the nucleus is larger and oval in form, and the protoplasm stretches off from it in one direction into a fibril instead of in two directions into a spindle. The cells are much smaller than human odontoblasts and nearer the size of ordinary spindle-cells of the human pulp. In fact, they look more like specially developed spindle-cells than odontoblasts. The formation of dentin begins on the surface, at the apex of a cone-shaped papilla of connective tissue, and proceeds inward. If the formation continues uniformly over the surface of the papilla, a solid layer of fine tubuled dentin results, but it often proceeds irregularly, apparently having special reference to the neighborhood of blood-vessels, so that irregular projections of dentin are found on its inner surface, dividing the pulp more or less into portions inclosed in larger channels or tubes. These may be very regular in arrangement and form around blood-vessel loops embedding the blood vessel in the calcified tissue, forming what has been called vaso or vascular dentin; but the formation is still from the surface of the pulp until it is obliterated, except for what remains in the larger canals. As distinguished from this formation of dentin we find in the body of the dental papilla of many fishes the formation of spicules of calcified tissue, shooting down through the substance of the pulp, which resemble neither dentin nor typical bone. They are more to be compared with the first formation of bone in membranes, or in the embryonal connective tissue of the body of the human jaw which is afterward removed by absorption and replaced by true Haversian system bone. These calcifications contain lacunæ, and have tubules or canaliculi running through them, and so, as Tomes says, are intermediate between dentin and bone. They divide the pulp into irregular spaces, and interdigitate,

or perhaps actually join, the formation of dentin which has been progressing from the surface of the pulp. These spicules run down into the bone of the jaw, forming an actual calcified attachment for the tooth with the jaw, but in this view of it it is to be regarded as a calcification or rather a formation of bone in the pulp-papilla interlocking with the dentin. In some of the fishes, as in *Scarus*, there is at the same time the remains of the cementum of the basal plate formed on the outside of the dentin around the base of the cone, which includes fibers which pass to the surface of the bone. Ankylosis is confined to the teeth of many fishes, and may be stated as a modification from the dermal scale, resulting in the reduction or loss of the basal plate and an ossification of the pulp continuing through the connective tissue at the base of the pulp to the body of the jaw.

The development of the fourth form of attachment, by implantation in a socket, seems to be an evolution starting from the same point but proceeding in a different direction. It is associated with the very great increase in the size of the teeth and consequent necessity for stronger attachment. This evolution is illustrated in the teeth of the reptiles. Wiedersheim classifies the teeth of reptiles as, 1, resting upon a ledge on the lingual side of the jaw, *pleurodont* dentition; 2, resting on the upper border of the jaw, with a slight ridge around them, *acrodont* dentition; 3, lodged in permanent alveoli, as in the crocodiles, *thecodont* dentition. These three classes illustrate three stages in the development of the socket method of attachment. In the simplest form there is a cone-shaped tooth attached to the bone around its base by fibers being built into the cementum and the bone. There is little modification of the rudimentary form and little development of bone for its attachment. In the higher form the tooth has become long or peg-shaped, and the bone has grown up around a portion of it to support it, but it is attached to the bone by connective-tissue fibers being built into the cementum on the surface of the peg and into the bone of attachment on the jaw. The development of the form of the tooth to the peg from the cone may be understood as a continuing of the development of odontoblasts and the formation of dentin (which always begins at the apex of the cone) farther and farther down on the sides of the dental papilla; then the formation of cementum which begins around the base of the cone and continues down on the outside of the calcified dentin, covering its outer surface and

building the connective-tissue fibers into the tooth. The development of the bone accompanies or rather follows that of the tooth, building the other ends of these fibers into the bone which is developed to support the tooth.

MODERN DENTIST FROM A MEDICAL STANDPOINT.

BY WILLIAM KNIGHT, M. D., CINCINNATI. READ BEFORE SECTION ON STOMATOLOGY, AMERICAN MEDICAL ASSOCIATION, JUNE 10-13, 1902.

I believe that a student, when matriculating at a dental college, should be impressed that he is about to enroll himself as an aspirant to membership of what is termed a learned profession. He would thus at the beginning of his studies realize that his curriculum must necessarily be a comprehensive one, embracing all of the studies pertaining to the profession of which he hopes to become a member. I believe few of those who have given anatomic lectures to dental students will dissent from the statement that, with few exceptions, it is difficult to impress the dental student how important it is for him to acquire a practical knowledge of anatomy. This would not be the case if they would view the matter as they should, from a medical standpoint. Last year when in London I was informed by one of the examiners for English qualifications for American dental graduates, that most of the candidates were defective in anatomic and physiologic attainments. The reason for this lies in the fact that heretofore the dental student has not realized how necessary it is for him to acquire a practical knowledge of these two studies. The progressive dental surgeon of to-day is conscious that his knowledge of anatomy and pathologic anatomy is essential to him, for he sees almost daily diseased conditions in the mouth and its surroundings, the character of which can be understood only by applying the teachings of these two sciences. The dentist not infrequently observes morbid conditions in the mouth that are produced by some constitutional disturbance. He thus finds himself confronting questions pertaining to general medicine. For instance, he may find healthy teeth loosened in their sockets, perhaps an entire row of them. No other morbid conditions are apparent; there are no symptoms, nor have there been, of Riggs' disease; there is no absorption of the alveolar processes; no shrinking of the gum tissues. An examination is made of the urine, sugar is detected;

the diagnosis of diabetes is made, and the indications for treatment become clear. In this connection the following cases present features of interest: An English army officer suffered from a severe and continuous pain in his left eye. The oculist whom he consulted, after exhausting all means of relief known to him and affording none, decided upon enucleation. The operation was performed, but unfortunately the right, the unaffected eye, was removed by mistake. There was no relief obtained for the left eye by the operation. It was now decided that the mouth should be carefully examined, which would have been done before the right eye was removed if a dental surgeon had been consulted. The examination of the mouth resulted in the discovery of a carious tooth, and, although the tooth gave but slight discomfort, it was extracted. The result was most fortunate. The pain in the eye abated at once, and in the course of a few days disappeared entirely.

A few years ago I treated a young man for clonic spasms of the upper right eyelid. After some ten days' treatment, the condition remaining the same, I advised him to consult his dentist. He smiled at this, but did as I advised him. He returned a few days afterwards entirely relieved of the annoying affection. His dentist had discovered a small painless cavity, which he treated, in an upper molar tooth. The clonic spasms of the eyelid in this case were evidently associated with the carious tooth, and afford a good illustration of some reflex act excited through the sensitive filaments of the second division of the fifth cranial nerve, affecting thereby some filaments of the seventh cranial, a motor nerve. These cases are illustrative, and indicate consultations should be more frequent between the dental surgeon and the general practitioner, and especially with the ophthalmic surgeon. A large number of cases could be cited to prove the dependence of one part of the human body on another part, and if the teeth were selected for this purpose, a most interesting group exemplifying this could be collected.

The teeth, although anatomically regarded as dermal appendages, have a very close functional relationship to several of the cranial, and more remotely to some of the cervical spinal nerves. How frequently are inflammatory conditions seen in the face, neck and even the external chest, that owe their origin to disturbed nutrition, brought about by irritation starting in a diseased tooth. In this connection, a case recorded by John Hilton in his classical work

on "Rest and Pain" is worthy of full quotation: "A professional friend had an enlarged gland below the external ear, the real cause of which was not quite apparent, so he requested me to look at it. There was a slight discharge of morbid secretion in the auditory canal. We argued together, and I said: 'Very likely it may be the result of a decayed tooth; irritation from it may be conveyed to the auditory canal and induce morbid secretion. That morbid secretion may produce slight excoriation, and that excoriation, aided by lymphatic absorption, may explain the existence of the enlarged gland.' The tooth was extracted, all the other local morbid conditions disappeared, and there was no recurrence of the local symptoms."

This case proves that irritation of a nerve, the fifth cranial in this instance, is sufficient to lead to more or less change in function and structure, and that morbid influence may, after a time, induce a deterioration resulting in ulceration, etc. How important also it is that the dental surgeon should be able to diagnose in an early stage the various neoplasms so frequently seen growing in the mouth, lips, jaws and tongue. Especially is this of great moment in instances of malignancy arising in the regions mentioned. It not infrequently happens that a patient, having an incipient malignant growth of which he is not conscious, has pain in a tooth, the pain in the tooth being caused by the presence of the small, malignant tumor. The failure of the dentist whom the sufferer consults to recognize the existing conditions may result in the destruction of the patient. Two instances of this kind have come under my observation during the past few years. In both cases the malignant growth was sarcomatous. One originated in the antrum, the other made its first appearance in the molar region of the inferior maxillary bone. In each case the tooth had been extracted for the relief of pain. Some months afterward, when the patients came under my observation, infiltration of the neighboring soft parts had occurred to such an extent that a successful result could not be expected to follow even a most radical operation. On the urgent solicitation, however, of the patient suffering with a sarcoma of the upper jaw, I agreed to operate with the understanding that in all probability the affection would return. At the time of the operation, I removed half of the upper jaw, together with a large quantity of sarcomatous tissue from the surrounding parts. Growth returned after several months, the patient dying a few months

afterwards from exhaustion. I refused to operate in the other case, as the floor of the mouth, the gum and the cheek were extensively involved. I, however, used injections of Colley's serum (the streptococcus erysipelatio prodigiosus), so highly recommended in inoperable cases of sarcoma, with the result, however, of adding to the sufferings of the patient, who succumbed to his affection six months after I first saw him.

Much more frequent than neoplasms and inflammatory affections, that have their origin from dental irritation, are those instances that are purely reflex in their character, and that are excited through irritation of the dental branches of the fifth cranial nerve. Most of these cases can be diagnosed only by applying the general principles of medicine to their elucidation; the constitutional peculiarities or taints of the individual must be considered. A rheumatic, gouty or specific habit must be recognized before rational treatment in any given case can be decided upon.

For the reasons given in these brief remarks, it must be apparent that the dental surgeon of to-day must have a knowledge of the principles of medicine, and by virtue of his professional attainments he becomes a member of that great brotherhood, the medical profession, whose mission it is to relieve human sufferings.

PREPARATION OF TEETH FOR MICROSCOPIC STUDY.

BY MARTHA ANDERSON, M. D., MOLINE, ILL. READ BEFORE SECTION
ON STOMATOLOGY, AMERICAN MEDICAL ASSOCIATION,
JUNE 10-13, 1902.

In decalcification the results have been far from satisfactory. In order to protect the dentin and get the pulp and dentin *in situ*, the slower methods of decalcification are better, but the delay has disadvantages. The acid mixtures penetrate and destroy the staining properties of the tissues and cause distortion: In order to save the pulp, the apical foramina have been sealed with collodion or sealing wax; this has not been satisfactory, as the sealing material comes off in spite of careful handling.

Nitric acid in weak solution gives slow decalcification. A 2 per cent solution, with frequent changing every few days, took over one month to give results. Lee says HNO_3 causes no swelling and does not injuriously attack tissue elements. This has not been my

experience, as it has caused much distortion and the tissue elements have been largely destroyed. It does, however, give fair sections of dentin.

Kleinenberg's method (Picric, 100 parts; H_2SO_4 2 parts; H_2O , 300 parts) is exceedingly slow, requiring several (5) months.

Schaeffer's recipe preserves the dentin, but the tissue elements are distorted and staining properties destroyed.

Von Ebner's solution took four months, dentin preserved, tissue elements distorted and stained badly, but not so badly as the others.

Boll (H_2CrO_4) gradually preserves dentin (two months), tissues distorted.

Haug's method (Phloroglucin 1, HNO_3 10, water 100) is rapid and has the advantage of penetrating dentin; the pulp tissue, however, is distorted and stained badly.

Huber's recipe (HNO_3 5 parts, HCl $\frac{1}{2}$, H_2O 100) is rapid, requiring only a few days. It also causes distortion.

H. Smith's recipe (HCl 10 per cent, 12cc, 16 hours; and HNO_3 1.5cc, 46 hours; 1.5cc HNO_3 , 66 hours) acts rapidly, entirely destroying the dentin and pulp structure.

H_2CrO_4 55 (H. Smith) is rapid, 8-9 days, destroys dentin and structure of pulp.

Andrew's solution is the only one that has given me any results that I can call good. (H_2CrO_4 140, HNO_3 6, water 400.) Its disadvantages are its very rapid action, the solution in full strength completely destroying the entire tooth in a few hours. I have gotten results from using half strength and changing very frequently, about every hour. If the tooth is forgotten for a few hours it is apt to be destroyed. If one is required to give attention to other matters for a time the specimen must be removed from the solution and placed in water, returned to the solution again when convenient to watch it. Even then decalcification is apt to take place unevenly, and sometimes in spite of great care the pulp is attacked and partly destroyed by the acid. After this solution sections have stained very well.

In preparing pulps for microscopic study, the pulps were removed from fresh teeth and hardened in Müller's fluid. Flemming or formalin have given the best results. For staining cellular elements a good hematoxylin combined with eosin or Van Gieson's method is very satisfactory.

As a special nerve stain, Weigert's method for medullated nerves

as follows: Harden in Müller's fluid, stain in a saturated solution of neutral acetate copper 24 hours, wash and pass into a stain composed of hematoxylin 1, alcohol 10, water 90, saturated solution lithium carbonate 1, for 24 hours. Then rinse in water and decolorize in borax 2, K. ferricyanid 2.5, water 200. The nerve will stand out a deep brown compared to the other tissues. In studying sections by this process the nerve trunks can be seen running from the apex of the pulp and branching off higher up, the fibrils running along the outer edge of the pulp just beneath the layer of odontoblasts. In a few cases I have been able to trace the nerve fibrils out between the odontoblasts, but not into the dentin.

In pulps hardened in Hermann's recipe the nerves can also be traced. In pulps prepared by Weigert's recipe the pulp stones (?) are stained dark brown as the nerves. If they are pulp stones, why do they stain thus?

So far the stains used for fibrous tissues and fat have been unsuccessful, but I have not yet completed my work in this line.

PARAFFIN—AN IDEAL MATERIAL FOR THE FILLING OF ROOT CANALS.

BY RUDOLPH BECK, D.D.S., CHICAGO. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

We may attribute a large number of alveolar abscesses, failures of crowns, bridges and fillings, to imperfectly filled root canals. Considering the difficulty of following the irregular, tortuous and minute root canals, and the uncertainty as to the number of canals in some teeth, it is not remarkable that either portions or entire canals are left unfilled by the use of materials that are recommended, such as points of gutta-percha, gold, tin, lead, copper, wood or cotton, chlorid of zinc, cement, sandarac, etc.

The objection to these agents is that their introduction into the roots is not certain to reach and hermetically seal the apical foramen so as to prevent the invasion of pathogenic microorganisms into the canals or apical space. Another objection is that the cutting away of much tooth structure, especially in bicuspid and molars, is necessary in order to have sufficient space for the introduction of most of these materials, thus reducing the strength of the tooth.

In reading an article published by Prof. R. Gersuny of Vienna

(*Zeitschrift fuer Heilkunde*, 1900, Vol. I, pt. 9), in which he demonstrated that if paraffin at a low melting point be injected into the tissues of the body and allowed to harden it will retain its solid consistency, remain there unchanged, and not be absorbed, the idea suggested itself to me that this same material could be utilized for the filling of root canals, and I at once set out to make experiments.

Permit me to submit the result of my experiments and the technique employed: A mixture of paraffin 96 per cent, white vaselin 4 per cent, is placed in a porcelain dish and brought to a boiling point, and if it be desired to color the same, alkonet may be added while being boiled. The tooth in which the roots are to be filled, after all the contents have been removed, is placed in an aseptic condition and is thoroughly dried out with hot air.

I have employed two methods for the filling of root canals with paraffin: 1. By means of injection with Anal's metal syringe, or Luer's glass syringe, which have been previously sterilized and kept warm, filled with liquid paraffin, inverted and all air expelled by pressing upon the piston. The needle is screwed firmly to the attachment, and pressed again; the piston is to force the paraffin into the needle point. The charged syringe is placed in hot water until ready for use, in order to keep the paraffin in a liquid state. The root being ready for filling, the solution, which should be at a temperature of about 160 F., is injected into the tooth. It will readily flow to the desired points, where it shortly after becomes cooled and hard and remains so. In filling roots of the upper denture, the patient is placed in a reclining position or with head hanging. A heavy tin foil or a lead disc with a central perforation is placed over the orifice of the tooth, thus preventing the material from escaping. A straight point with the syringe is used. While filling the lower teeth the patient sits upright and a curved point is required.

The other method is to my mind preferable, especially in the lower denture. The roots are prepared in the same manner. A sufficient quantity of the mixed paraffin (previously boiled and allowed to harden and kept sterile) to fill the number of roots is placed into the tooth. A soft metal disc with a central perforation is placed over the orifice of the tooth, and a continuous stream of hot air conducted from an apparatus devised by Dr. J. C. Beck of Chicago will dissolve and force the paraffin into every minute opening in the tooth. It is then allowed to cool and harden. I have employed the method with

the material described in a large number of root fillings for the past twelve months with good results.

Conclusions.—1. That the material can be made absolutely sterile by boiling. 2. Readily adapted to the walls of the space it is designed to fill, and unchanged by the influences of the body. 3. Not necessary to cut away as much tooth structure for its insertion. 4. Less time to insert, and especially to remove. 5. Absolutely painless to the patient while being inserted, and no tenderness of the tooth, which is so frequently mentioned, after the roots are filled.

In this connection I desire to point out another utility of the mixture of paraffin and vaselin, employing the same technique as previously described, except that the paraffin should have a melting point slightly above the normal temperature of the body, between 99 and 109 degrees F. Injected beneath the mucous membrane lining the alveolar sockets of teeth immediately after their extraction and stoppage of hemorrhage, it will prevent the entire absorption of the bone. This is of great importance, especially in the preservation of the cuspid eminence, retaining the facial contour, and in cases where all the teeth have been removed and artificial dentures are to be substituted, the cuspid eminence will form the foundation for the setting up of artificial teeth.

Gersuny reports a number of cases in which he substituted paraffin for absent parts, and since his publication other well-known surgeons have employed his treatment, in pathological conditions of like character. Dr. Maszkowicz (*Wiener Klinische Wochenschrift*, 1901, No. 25) reports the injection of paraffin about the ends of a resected nerve, to prevent their union; also the introduction of paraffin between the joint after the breaking of an old ankylosis, to prevent recurrence of adhesions. A small opening between the nose and the mouth, left after staphylorrhaphy, was closed by paraffin. The best results in this treatment are obtained in the correction of deformities following cicatricial contractions from loss of tissue through disease or operative procedure. Last September I injected paraffin into the alveolar sockets of the upper cuspids. The opening became occluded with granulation tissue, and a few weeks ago when I last saw the patient, a decided prominence was noticeable where the paraffin injection was made.

Discussion. *Dr. L. S. Tenney*, Chicago: The requirements of an ideal filling material are—first, it must effect a perfect closure of the canal; second, it must be insoluble; third, it must not absorb the

fluids of the body, and, fourth, it must cause no serious disturbance in case it should be crowded through the apex of the root. The root canals of teeth have been filled with almost every conceivable material, but they have all been found lacking in some essential feature and been abandoned. To-day we confine ourselves almost exclusively to the use of gutta-percha, but we do not succeed in thoroughly filling the canals with it. In the distal canals of upper molars, the mesial canals of lower molars, and lower incisors, it is the exception rather than the rule to find one perfectly filled. I have examined several thousand extracted teeth, making longitudinal sections, and know whereof I speak. The reason why pulpless teeth do not give more trouble is not because the canals have been well filled, but because the teeth get along pretty well without it. However, the percentage of failures is sufficient to make necessary a material with which more definite results may be obtained. The ideal root filling must be one that may be introduced in a fluid state and then solidified within the canal, for any substance that is sufficiently rigid to enable us to force it to the apex of a tortuous root must necessarily lack that yielding property which will enable us to make a perfect closure. Gutta-percha is not a fluid, and while it is sufficiently soft to adapt itself to the surrounding walls, it is not rigid enough to enable us to force it home with any certainty. Paraffin meets all the requirements outlined above, but I apprehend some difficulty in mastering its manipulation. The essayist has advocated two methods. In regard to the first, it seems to me that we would have a great deal of difficulty in the canals in the posterior teeth not easy of access; and as regards the second, when this substance is melted it flows almost like water, and I should think that before we could force it to the apices of minute canals it would be driven out of the cavity around the edge of matrix. However, Dr. Beck has experimented for some time and has reported excellent results, so I believe that when the ingenuity of the profession has solved the problem of manipulation a new departure will be marked in operations of this character.

Dr. C. T. Gramm, Chicago: The idea of using paraffin for filling root canals is not new. I demonstrated its use in St. Louis, and "Filling Fine, Tortuous Root Canals" was the subject of a paper before a Chicago society in 1892. I believe the operation then suggested is more feasible and more likely to be successful than the method proposed by the essayist. I inserted into a fine root canal a copper point tapered to such a degree that it would easily enter; a

piece of paraffin was then placed about the copper point, which was left to protrude into the crown cavity, and a cautery knife heated to redness was brought in contact with the copper point. The paraffin immediately melted, and capillary attraction drew it to the end of the point and along the previously oiled wall of the canal. I do not to-day advocate this method, because, although ideal in theory, it does not carry with it that certainty of action which must be the cornerstone of all scientific work. Much less certain than the above, and I might say impracticable, seems the attempt to inject molten paraffin into fine root canals with a syringe. In speaking of filling root canals, I dwell only on those conditions which are difficult. For filling large accessible canals we have to-day no better means than we had years ago, namely, a solution of gutta-percha and eucalyptol, followed by a gutta-percha point. The difficulty that I believe the profession would have with Dr. Beck's method is in disposing of the air in the canal, as I cannot take it for granted that the hot blast would force the air out of the canal and the paraffin into it.

There is, however, a field for paraffin in oral surgery, and I would suggest its use in the curing of long-standing, chronic abscesses. I mean those where nothing will avail but incision of the gum at the apex of root, burring away of necrosed bone, smoothing of the apex of root as much as possible, and filling with paraffin the cavity thus created, care being taken to close the field of operation with a stitch or two in the gum tissue.

Dr. T. W. Brophy, Chicago: At the last meeting of the Northern Illinois Dental Society Drs. Hanaford and Sowle imbedded about sixty teeth in plaster, and sent them to as many operators, with the request that the canals be filled according to the dentist's usual method. About forty-eight were returned, of which fifteen passed as good fillings, but the others were defective, varying from no filling at all in the roots to a portion of some roots filled in certain teeth. I presume that even the most skillful operator, using the best material, does not always fill tortuous roots clear to the apex. If Dr. Beck has found a material which will show a higher percentage of success we shall certainly be indebted to him. The value of paraffin has long been known in surgery, and I think those who have discussed the paper have failed to remember that the essayist suggested its use in other ways. I can readily see how it could be used for all the purposes which Dr. Beck has outlined, and if successful it would be a great boon to dentistry and other professions, and to the community

at large. A great amount of suffering and disfigurement would be avoided by our patients and a great deal of time saved by us.

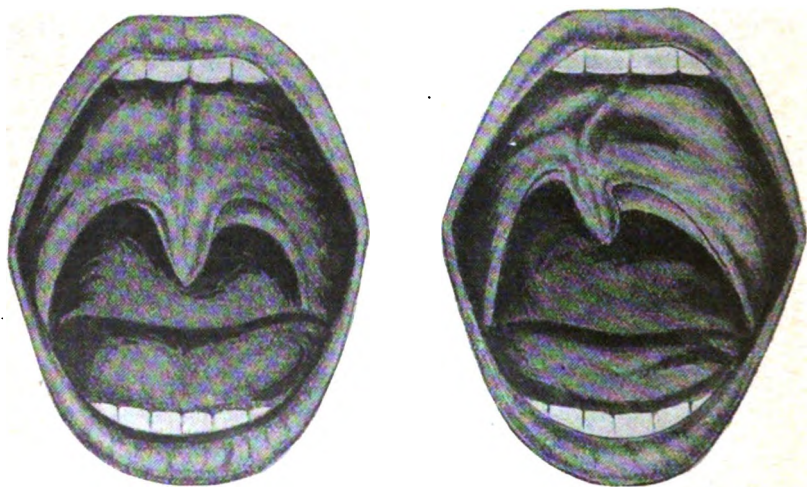
Dr. G. W. Dittmar, Chicago: It is not so much the filling material as it is the thoroughness with which root-canals have been previously treated, for if they are aseptic and dry, they will be all right when filled with almost any material that is non-irritating, non-absorbent and non-shrinkable. I should think that Dr. Beck's method would be very good for filling punctured roots. I would ask him if paraffin readily adheres to the walls of the canal.

Dr. Beck, closing discussion: Replying to Dr. Gramm, I do not claim originality in the use of paraffin, but if anyone used it previously he failed to record it, as I can find no record of its employment for root filling. If, as the Doctor states, it was used without success, this does not signify that we should discard it. The method has proved successful in my hands, as I have injected a number of teeth in and out of the mouth, and have found that the material penetrated the minute openings, so I claim it is an ideal agent when properly handled. Dr. Dittmar speaks of treatment being the most important point in root fillings, but roots do not always require treatment, and in a great many instances are filled without any, especially after the immediate devitalization and removal of pulp, when the roots could not be in a better condition. I mentioned in the paper that paraffin will adhere to the walls of the cavity. It is not dissolved by the fluids of the mouth or by water, but is solvent in alcohol.

LITHIASIS OF THE SUBMAXILLARY GLAND.—Lafarelle (*Revue Heb. de Laryng.—Jour. A. M. A.*) states that the pains caused by the presence of calculi in the submaxillary gland are frequently ascribed to the throat and ear, as they radiate in all directions. Two cases are described, one in a woman of forty, the other in a man of forty-five. Besides the functional and physical signs of salivary lithiasis, the paroxysmal pains, the alternating swelling and subsiding of a submaxillary tumor, the discharge of purulent saliva from the tumor on compression and palpation of a hard substance, the complete permeability of Wharton's duct for the catheter, indicated the location of the trouble. The preferable operation is the systematic extirpation of the submaxillary gland, as the acute inflammation caused by the calculi is certain to be followed by sclerosis of the gland. Even if the inflammation is slight, the gland should be removed to prevent recurrence. The operation is simple and easy. The facial vein has to be severed, but the facial artery and the hypoglossus nerve are left intact. The insignificant scar is hidden by the lower jaw.

Digests.

PALATAL PARALYSIS.—By Dr. S. Erben, Vienna. The following case of paralysis of the palate will best illustrate the care necessary for the diagnosis of paralysis in the neighborhood of the buccal cavity. The patient was a grocer's assistant, aged 27, who had enjoyed perfect health till three weeks previously, when he was attacked with fever and general prostration. Ten days later he had so far recovered that he could return to work. About a fortnight after this he observed that he could not swallow as well as he usually did, every effort to swallow being followed by regurgitation through the nose or flowing back into the mouth. There was no hoarseness



or cough, and the tongue and lips were intact, while speech was perfect. The mucous membrane of the throat and mouth was pale, no inflammation to be observed anywhere, while the tonsils were barely visible. Nowhere was there any white deposit. There was no adenoid growth on the posterior surface of the fauces, but it was observed that the uvula was asymmetric, as both the palato-glossal and the palato-pharyngeal arches were to be seen distinctly deviated to the left side, while nothing but the anterior arch could be seen on the right, as the former quite covered the latter. When at rest the arches of the palate were seen as in Fig. 1, but when phonation was performed the appearance was as in Fig. 2, which showed the healthy muscles of the right side dragging the uvula to that side.

From this asymmetry it was clear that unilateral paralysis of the palate was present; the drooping state of the palato-pharyngeal arch and the disappearance of the right arch, together with the difficulty in swallowing, all pointed in this direction, unless indeed the asymmetry were due to hypersensitiveness of the right side. The phenomena remained stationary during the following two weeks' treatment, while the electric current produced no tangible effect.

The following epitome may be repeated for a clear comprehension of the case. The complete elevation of the velum palati on the right side proved the integrity of the levator veli palati muscle as well as the circumflexus or tensor veli palati, while its hyperextension would be due to the loss of outward traction in the palato-pharyngeus. The passive uvula retaining its normal position till disturbed by the displacement in the other parts by unequal forces, such as phonation, while the posterior pillar of the fauces hung down loose, pointed to the paralysis of one isolated muscle, viz., the palato-pharyngeus.

After three weeks' treatment deglutition was performed quite freely. Inspection proved both sides of the posterior velum palati to be equally distended and the arcus palati normal in the power of distension.—*Medical Press and Circular*.

CALCIFICATION OF DENTIN AND ENAMEL, AND ITS RELATION TO HYPERSENSITIVENESS IN THESE TISSUES. By I. N. Broomell, D.D.S., Philadelphia. Read before the Pennsylvania Association of Dental Surgeons, April 8, 1902. Recognizing in the beginning that there can be no better way to study the physical characteristics of the tissues of an organism than by an examination into its mode of development, your attention will first be directed to the process of calcification in two of the tooth tissues, the enamel and the dentin, with a view to establishing, if possible, the manner by which the hypersensitiveness common to these tissues is brought about.

Both enamel and dentin in their normal state are practically devoid of sensation; of the latter it may be said that it possesses sensation to a slight degree. The only sensations conveyed to the brain through the pulp are those of pain, and we find therefore that the pulp with its many nerve filaments is not at all active as the organ of the sense of touch in the tooth, but that this belongs to the alveolo-dental membrane. For the reasons above stated, therefore, the term hypersensi-

tiveness is used instead of sensitiveness, to distinguish it from slight normal sensations.

In enamel we have a characteristic epithelial tissue, a structure largely made up of cells with little intercellular substance. In dentin we have a characteristic connective tissue, with the intercellular substance predominating. While the source and mode of development of these two tissues are entirely different and independent, they are so closely associated during this process and after its completion that they are sometimes spoken of as intermingling one with the other. This intermixture, if present, is brought about by the passage of the terminal ends of the dentinal fibers beyond the dentin into the enamel. While the microscope reveals in some instances what appear to be prolongations from the dentinal fibers penetrating the enamel, or between its prisms, it is one of the objects of this paper to show that such a condition is improbable, if not impossible. If this condition is present at all, it is so slight as to have no influence whatever over the enamel, either as to its nourishment or its sensation. No conclusions can be drawn with positive certainty from sections, since the slightest deviation from parallelism in the surfaces may easily produce deceptive appearances. It is just as common, and even more so, to find hairlike lines interwoven and running parallel to the surface of the dentin immediately between this tissue and the enamel, as it is to see slight fibers crossing beyond their boundary line to penetrate the enamel. The most likely place of all to find such a condition would be in the beginning of calcification, and here it is never observed.

After the dentin germ has assumed the exact size of the dentin of the future tooth, certain cells appear on its periphery, and under their superintendence a definite layer of dentin soon results. This first-formed layer of dentin is definite and unchangeable in location, and it has within its substance the minute processes from the dentin-forming cells which are destined to become and really are the terminals of the dentinal tubules. All who have given the subject of dentin calcification careful consideration are practically agreed as to the part which the peripheral pulp-cells play in the process. This is to the effect that not about the body of the cells themselves, but around their processes, the lime salts are deposited. After a distinct layer of specialized cells has become fully established upon the very periphery of the papilla, the first change which takes place is a slight withdrawal of these cells from this point, leaving behind slender hair-

like processes which occupy a portion of the space previously taken up by them, and about the extremities of the cells and their processes which are directed toward the enamel organ calcified material is generated. Zone upon zone of calcified dentin appears in this way, the body of the cell receding, leaving in its wake its processes encapsuled within the calcified structure as the dentinal fibers.

Now, what do we observe here favorable to the theory which it is proposed to sustain in regard to the terminal branches of the dentinal fibers? At no time do we find the peripheral pulp-cells, usually all classed as odontoblasts, outside of their own territory, the dentinal papilla; but their location in the beginning on the very surface of the papilla, almost in direct contact with the inner tunic of the enamel organ, would make it possible for their processes when appearing to penetrate between the cells of the enamel organ if they were grown out from the body of the cells from which they spring. This, however, they do not do. They do not grow out from the cell body, so to speak, but the cell recedes, leaving them behind. By this arrangement the terminals of the future fibers (?) become definitely established, all increase in length taking place in the opposite direction, toward the pulp. While the active enamel-forming cells are present some little time prior to the odontoblasts, calcification of the enamel does not take place until after a definite cap of dentin has been formed, imprisoned in which are the terminal branches of the fibers (?). Therefore the fact that this cap of dentin is formed first, and this is not a question in dispute, with the fibers or cell processes securely encapsuled within, it would seem to be sufficient evidence to qualify the statement that the so-called dentinal fibers do not penetrate the enamel. The examination of many sections of young growing teeth exhibits the fact that the early-formed dentin and enamel will separate bodily, leaving a positive clear line of separation and a surface absolutely devoid of anything resembling the prolongations of the fibers extending from the surface of the dentin.

The growth of enamel, stratum upon stratum, from within outward is generally believed to be by the direct calcification of the enamel cells or ameloblasts, and while this is going on, and as long as the crown of the tooth is encased in its epithelial cap, the enamel organ, the growth of the tissue is stimulated through the blood-vessels everywhere present in the stellate reticulum. The presence of this specialized blood supply to the central portion of the enamel organ was for

a long time doubted, but at present it can be readily observed. As soon, however, as the tooth passes through the surface tissue, carrying with it the external epithelium of the enamel organ as the enamel cuticle, the possibility of nourishment has been cut off, and after a little time it becomes a petrified dental epithelium no longer nourished and absolutely non-vital.

That the enamel is practically of inorganic material and therefore not capable of transmitting or receiving sensations may be demonstrated by the simple experiment of immersing a thin section of this tissue in a weak solution of chromic acid, the result of which will be a speedy separation of the enamel prisms which have been liberated by the destruction of the interprismatic substance. What does this signify? Chromic acid is one of the best preservatives of organic tissue known, and if the cementing substances in enamel were organic, or even partly so, the prisms by this test would not be freed, but instead would become more firmly cemented together. Therefore we infer from this that the interprismatic substance is even less highly organic than the prisms themselves, these not being acted upon until after the material which holds them together. Notwithstanding all this we have it said that the dentinal fibers enter the enamel between the prisms and possibly nourish it and furnish it with sensation. If the argument thus far produced is reliable, and it may have a semblance of truth, being based upon considerable actual observation, the question of hypersensitiveness in this tissue as observed in superficial caries would appear to be one somewhat difficult to comprehend.

In the synopsis of this paper, given upon the printed announcement of this meeting, the question is asked, "Do sensory nerve filaments traverse the dentinal tubules and penetrate the enamel?" While it is generally believed that the contents of the dentinal tubules not only transmit sensations, but also carry a sort of fluid from the blood plasma, no positive proof has ever been offered in support of this opinion, nor is it the intention of your essayist to discuss this question at this time, the effort being to add some little to the literature on the subject, taking exception, however, as to the character of the tubular contents and to that portion of the general subject which refers to the passage of the fibers beyond the dentin into the enamel.

In connection with the primitive layer of dentin-forming cells, there are usually described lateral processes passing from cell to cell, apparently serving the purpose of communication between the cells.

But these have recently been shown to be simply a network of connective-tissue fibers suggesting the body of the cells, but even were these acknowledged to be processes belonging to the body of these peripheral pulp-cells, their presence would not interfere with, but rather favor the theory about to be advanced. The theory of Andrews, brought out some years ago in regard to the specialized layer of pear-shaped cells, dentin corpuscles, as he termed them, may be accepted, and these will be considered as having something to do with the process of dentinification. The presence of these pear-shaped cells at the beginning of calcification and during the continuance of this process can be easily demonstrated, and if we accept them as being concerned in the process of dentin formation they might in a measure modify the function now accorded the elongated club-shaped cells, the odontoblasts.

In young tissue there is present, besides the odontoblasts and pear-shaped cells above referred to, numerous racemose cells which appear to be individualized. And these, as well as the pear-shaped cells, may take some part in the structural formation of the tissues. The idea which it is desired to bring out is as follows—that the odontoblasts alone are not responsible for the growth of dentin, that they undoubtedly control the actual process of lime deposit, but the additional cells, no doubt, contribute to the structural make-up of the tissue. It may be that by modifying certain parts of the matrix, the result in the general structure is the dentinal sheaths; this part of the tissue being so markedly different from the bulk of the intercellular substance would lead us to believe that it was developed from specialized cells. Further, it is desired that the fact shall be understood that while the dentinal tubules are filled with a living substance, this substance is not solely the product of the processes of the odontoblasts. That there is a special distribution of non-medullated nerve terminals as well as a rich plexus of blood-vessels about the periphery of the pulp is unquestionable, and this supply is just as plentiful, or perhaps more so, at maturity as it is at the beginning of calcification, when the dentin cells are most active. From this we might be led to believe that this special blood and nerve supply to the periphery of the pulp is not solely for the upbuilding of the dentin and therefore distributed to the peripheral cells, but also for the permanent welfare of the resultant tissue, this being brought about by some circulatory system throughout the tubules of the dentin. A portion of the contents of the dentin tubules appears

to be a perfectly solid and homogeneous substance, and that it is of the fibrous nature can be proved by the remarkable degree of extensibility present. This is especially noticeable in specimens made from young teeth, in which case the body of the cells in contact with the forming dentin may be pulled back from this point a considerable distance without rupture of the process.

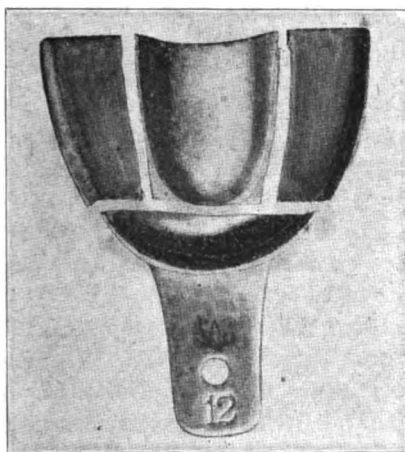
Let us now try to satisfy ourselves as to what these tubules contain, and ascertain in this way the manner by which sensations are conveyed from the surface to the interior. It has never been fully demonstrated that true nerve-fibers enter the dentin along with or in the substance of the dentinal fiber. Some contend that the contents of the tubules are made up of, first, a creative portion, that given off directly from the odontoblasts; second, a circulatory portion, a minute vessel traversing each tubule, entering either by the side of the cell bodies or passing through them, and that the nerve terminals are distributed in the same manner. Others say that minute nerve filaments from the pulp pass directly through the odontoblasts and are continued in the center of the tubule surrounded by a simple connective tissue, the cell process, and that in this way sensations are conveyed.

With all due consideration for these opinions, your essayist, after careful research, aided by many specially prepared sections, desires to offer the following in reply to the question under consideration: That dentin is a highly organized connective tissue; that it has a circulatory system and is endowed with sensation to a slight degree; that these conditions are brought about not by actual entrance in the tubules of separate vessels and nerve filaments, but more in the way of the tubules being occupied by a general connective tissue substance resembling in all essential features the pulp itself, being the semi-fluid interfibrillar ground substance of the pulp; that the processes from the odontoblasts and possibly those from the other cells named enter the tubules is not denied, but that they do so to a limited extent only is asserted; that dendrites of sensory neurons everywhere present in the pulp after losing their medullary sheaths divide into fine varicose fibers and become closely associated with the peripheral cells and pass between these and enter the cone-shaped openings of the tubules and terminate soon after doing so; that the cause of hypersensitiveness in the dentin is due not to the fact that the nerve terminals themselves have been irritated, but that this irritation has been conveyed to them as they lie deep in the substance of

the dentin through the semi-fluid circulating substance penetrating the tubules to their utmost terminals.

Now as to the manner in which painful sensations are brought about by mechanical or other irritation in the enamel, this structure which we have classified as being absolutely inorganic, a petrified dental epithelium and therefore devoid of nourishment and sensation. The term painful sensation has been employed in this connection because, as before stated, no other exists, what may be regarded as the sense of feeling or the sense of touch being conveyed to the brain through the medullary nerve-fibers which have their free endings in the peridental membrane. The painful sensations it is believed can be explained from the fact that cases of abrasion and superficial caries confined to the enamel alone become after a time sources of irritation to the tubular contents, which in turn convey the irritating effect to the pulp itself.—*Brief, June, 1902.*

PLASTER IMPRESSIONS. By Jose Valderrama y Barrenechea, Philadelphia. Every dentist is familiar with the difficulties which accompany the taking of plaster impressions of mouths in



which some or all of the teeth are present. These difficulties are further increased when the teeth are irregularly placed and when their direction is such that the impression cannot be removed, we will not say without breaking it—for that is almost an impossibility—but without fracturing it into so many small and irregular pieces that

the operation of fitting them together with wax becomes not only a very long, but also a very tedious task.

To avoid these difficulties we have adopted the following procedure which has given us satisfactory results, and which we believe will be especially useful to orthodontists, this class of practitioners being more likely than others to be called upon to take impressions of mouths in which all the teeth are present. The method is as follows: An impression tray suited to the particular case is divided into *four pieces*, as shown in Fig. 1, the front piece embracing the incisors and possibly the cuspids, the two lateral pieces the teeth be-

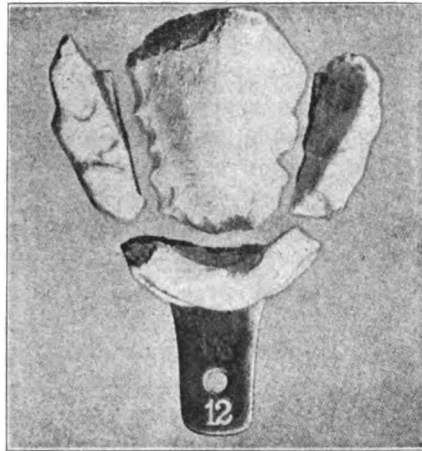


yond the cuspids, and the fourth piece the roof of the mouth. The four pieces are then waxed together with hard wax and the impression is taken in the usual way.

In removing the impression, the purpose of having previously divided the tray at once becomes manifest. The front section is first broken away—the *fracture necessarily following the front dividing line of the tray*. (Fig. 2.) Then the lateral sections are removed in like manner, and finally the palatal portion. Each section of the divided tray carries with it its corresponding section of the impression, yielding a matrix in four parts (Fig. 3.), readily adjustable by reason of the large fracture surfaces of plaster which serve as guides in accurate coaptation. After all the sections are reunited with wax the impression is ready for the further steps usually taken in the

preparation of a cast. This plan of procedure is also very useful in view of the fact that it obviates the troublesome and annoying operation of first removing the tray and then cutting the impression.

It is of course to be understood that it is not imperative or essential



to cut the tray always into four pieces only. If the practitioner judges that by cutting it into five or more pieces the operation is further facilitated in a given case, that should be done, the principle involved in this procedure being simply to divide the tray in such a way that the impression shall be fractured into large and regular pieces predetermined in size and direction by the section lines of the divided tray.—*Cosmos*.

RESTATEMENT OF THE PRINCIPLES OF EXTENSION FOR PREVENTION AND SOME CORRELATED SUBJECTS.
By G. V. Black, M. D., D.D.S., Sc.D., LL. D., Chicago. Read at the annual clinic of the G. V. Black Dental Club, St. Paul, 1902. In articles which I published in the *Dental Cosmos* in 1891, entitled "The Management of Enamel Margins," I first used the phrase "extension for prevention" as expressing a prominent fact in the methods of procedure which I was advocating in cavity preparation in proximal decays. Judging from the amount of discussion which this phrase has provoked, and the widespread betterment of filling operations in these surfaces which has resulted, I must conclude that the

use of this phrase has been particularly fortunate in aptly expressing a method of procedure that is in itself important. Although this expression can no longer be regarded as belonging exclusively to me, by reason of its having been taken up and pushed in discussion by many others, notably Drs. Wedelstaedt and Johnson, still I may be excused if at this time I make a restatement, from my own point of view, of its meaning and of its proper limitations in practice after the years of study that have elapsed since it was first announced.

I may say that the incentive to write the papers on the management of enamel margins was obtained through the attempt to conduct an extended series of clinics for the benefit of the students of the Chicago College of Dental Surgery when I was connected with that school, and critically noting the procedures employed by a large number of excellent operators. The close study that I had given and was giving to this subject in my own practice, which I now see was peculiarly well adapted to this class of study, convinced me that the manner of teaching methods of practice and the training of dental students in manipulative procedures were faulty in the extreme, and I was filled with the notion that more definite methods should be devised and employed. My private practice had long been what is termed a family practice, in which many families of children grew up under my care; and in whom I could study the results of treatment in a wide variety of cases from youth up. My system of records, while not very elaborate, was such that I could conveniently make these studies with great accuracy as to the date of operation and methods employed and note the results.

One of the most important steps in these studies, though the wording in my articles of 1891 was not just what I would now wish, was the sharp division of cases of recurrence of decay after filling into two classes. First, those due to the faulty manipulation of gold in packing, or the failure to make fillings completely water-tight; and second, those cases of recurrence of decay from an actual rebeginning of the carious process upon the surface of the enamel beside the filling, which was in itself perfect. When decay recurs from faulty manipulation of gold, or imperfect adaptation to the walls and margins of cavities, it begins between the filling and the cavity wall and runs under the filling as far as the adaptation was originally imperfect. This is recurrence from leakage. In the second case the recurrence of decay is close beside the filling, but careful examination shows that it has not run between the filling and the

cavity wall, but is in fact a new decay that has started in the enamel beside the filling and is penetrating the dentin in the manner and form of a decay that has started anew superficially. This will usually be semi-circular in form, the gold filling occupying one-half of what would be the usual circular form of the cavity, and otherwise penetrating as an original decay. In proximal cavities as formerly prepared it was particularly noted that these occurred at the rounded angles of the fillings at the bucco-gingival and linguo-gingival in much greater frequency than elsewhere. And also in buccal and labial cavities, in which in those days decay was proverbially prone to recur, a similar recurrence would appear to the mesial and to the distal of the filling; or to the gingival if this margin were not overlapped by the free margin of the gum.

These classes of recurrence of decay when studied with accurate records as to dates at which the fillings were made led to the adoption of means to prevent them. The first class, those from faulty adaptation of filling material, of course led to improvement in methods of packing gold, which in itself might well form the subject of an essay, the principal key to which is the management of the force used, and especially such stepping of the plugger as will constantly bring the condensation against a wall into the form of a wedging of the gold between the cavity wall and the gold already condensed. But this must now be passed with this remark. With it extension for prevention has nothing to do.

The superficial recurrence of decay, or that which formed a new cavity beside the filling instead of penetrating between the cavity wall and the filling, required a different treatment. The fault lay beyond the manipulation of gold and must needs be looked for in the plans adopted in the preparation of the cavity. The important fact was that an area of tooth surface that was especially susceptible to future decay was left beside the filling, and this should have been included within the original outline of the prepared cavity. To do this required the judicious extension of the cavity at this important point; and this was denominated "extension for prevention." This consists essentially in squaring out the bucco-gingival and linguo-gingival angles of the otherwise rounded gingival portions of large or medium large cavities in proximal surfaces, making the gingival wall flat bucco-lingually; while smaller proximal cavities were cut to a medium size and similar form when prepared in the teeth of those very susceptible to caries, and especially in children and young

people. If the gum septum did not already overlap the gingival margin, extension was made gingivally to attain this. This squaring out of the linguo-gingival and bucco-gingival angles necessarily carried with it the cutting of the cavities of equal width to the occlusal surface, or to parallel buccal and lingual walls, for the purpose of facilitating the placing of the filling material. It had already been demonstrated to my own satisfaction that this practice was successful in preventing this form of recurrence of decay.

In a paper before the Illinois State Dental Society in 1893, entitled "The Anchorage of Proximate Fillings in the Bicuspids and Molars," this was supplemented by showing that the probable force of the occlusion was such as to require that all of these fillings be anchored in a step cut for the purpose in the occlusal portion of the tooth, even though decay existed there, instead of depending upon grooves or dovetails cut toward the lingual and buccal in the proximate cavity, as had been the general practice. Coupled with this was the seating of the filling upon a flat gingival wall, and a flat pulpal wall of the step portion to give it still greater stability. In this presentation the force of the occlusion of the human teeth was discussed and the fact pointed out that the dental profession had then no knowledge of its amount in pounds, and the statement made that it probably reached hundreds of pounds. This discussion led quickly to the devising of instruments for the measurement of the force of the bite; notably one by the late Dr. J. J. R. Patrick, and one by Dr. George J. Dennis, called the gnathodynamometer. The first of these made were soon shown to be insufficient in their register of pounds, and had to be strengthened to full three hundred pounds before the measurement of the force of the bite of the strongest persons could be accomplished. My own instrument, which I have used since 1894, registers two hundred and seventy-five pounds and every year when I take the register of my senior class I find from one to two in each hundred persons who will close it; and evidently could register a greater number of pounds. This abundantly confirmed the necessity for the greater strength of the seating and anchorage of these fillings, as had been contended, and this has become the accepted practice by those who have followed these investigations with a fair degree of accuracy.

But this much was only a part of the program of improvement of method that had been proposed in the papers of 1891. The study of the normal form of the contact point between proximal

surfaces and of the interproximal space, and the influence of variations in these forms in preventing or in affording opportunity for the recurrence of decay, were presented. The necessity was urged that the best of rounded or marble-like contact points be formed on proximal fillings to maintain the breadth of the interproximal space, and as the form best suited to prevent injury to the gum septum by food lodgments which would soon produce disease of the periodontal membranes, or conditions favoring recurrence of decay at the gingival margin of the filling. Something of this had been urged before under the term "knuckling," but under this term no accurate studies of tooth surfaces or of the forms of the interproximal space had been made, and after careful consideration of the term and its loose use I decided that the more accurately descriptive term "contact point" would best suit the case and the studies of the surface that were given. Before that time most operators were finishing the proximate surfaces of fillings flat with the separating file. Even those who were making some study of contour, and were making contour fillings, so-called, were still finishing the central portions of these surfaces flat instead of to that marble-like roundness which is the normal form, and that will prevent lodgment of food. For that reason even many of the larger fillings were still failing at the gingival margin because of the lodgment and the fermentation of food, even though the manipulation of gold had been otherwise perfect. And, strangely enough, as it seems to me now, the cause of this was persistently overlooked. This seems to have been true in some measure of the work of the lamented Dr. Marshall H. Webb, who in his manipulation, both in cavity preparation and the formation of the contour of proximate surfaces, approached most closely the forms recently advocated. It seems, however, that he was unable to put his plans of procedure aptly into descriptive words, probably from the want of a sufficient knowledge of dental anatomy and the lack of terms in which to express his thought.

Another feature that was causing the unnecessary loss of many teeth was the prevalent notion that some teeth were soft and therefore decayed readily, while other teeth were hard and because of that fact resisted decay. The so-called soft teeth did not receive that vigorous treatment which the conditions demanded, because of the feeling that treatment would fail. A series of studies published in the *Cosmos* of 1895 showed that this was a delusion, and estab-

lished the fact that there is no such difference in the solidity of the teeth as will serve as a basis for such a thought. For all practical purposes of resisting decay and receiving metal fillings, the teeth are of equal density whether the patient be young or old. The accuracy of these findings has been sufficiently determined. The cause of the more rapid decay of some teeth than others must be looked for in their environment, which will be discussed later.

These studies taken together have placed the treatment of proximal decays and buccal decays upon a basis so different from the former conceptions of the case as to form practically new plans of procedure and new rules of practice differing essentially from the old. But this practice is not or should not be founded upon these studies alone. They serve only for the development of the technical or mechanical side of the case; the pathological side is left without consideration, or is studied only in the empirical way by noting and comparing conditions at different times. This is supplied by a study of dental caries and its methods of attack. In this paper I can mention only those fundamental features of the most practical character. First of all it should be noted that decay attacks the teeth only at certain points, called areas of susceptibility, and that all other portions of the tooth surface are immune to the beginnings of decay. This is so pronounced that any one of us, in examining a mouth, will invariably give attention to certain portions of the surface of each tooth, its areas of susceptibility, not expecting to find decay beginning elsewhere. For the practical purposes of this discussion these points of beginning of decay are of two classes, the pit and fissure class and the smooth surface class. The first is confined to pits and fissures of the occlusal surfaces of bicuspid and molars, pits near the junction of the occlusal and middle thirds of the buccal surfaces of the molars, and pits in the lingual surfaces of the upper incisors. With this class extension for prevention as employed on smooth surfaces has nothing to do whatever, for the reason that in them decay does not recur about fillings except as a result of imperfect operating. It is true in these that grooves must be cut out sufficiently to get a margin level enough for a smooth finish, constituting an extension of the cavity, but this is for a different purpose from extension for prevention in smooth surface decays. The second class includes those decays beginning in the proximal surfaces and in the gingival third of the buccal and labial surfaces of the teeth. Decays occur on

other less susceptible smooth surfaces, as the lingual; but so rarely that they may be ignored in this discussion.

It is to these decays in smooth surfaces that extension for prevention properly applies. The reason for its application to these and not to the pit and fissure class is found in the nature of the surfaces and their relation to that cleanliness produced by the normal uses of the teeth. The teeth have been so formed that the uneven surfaces, or surfaces broken by cusps, with grooves and pits between, are the occlusal surfaces, or those that are exposed directly to abrasion during mastication of food, and are therefore subject to frequent thorough cleaning by abrasive action in chewing, except in the immediate pits and grooves that afford permanent lodgment for debris. Caries always begins on the surface of the tooth—it is produced by microorganisms growing upon the surface of the tooth and acting upon that point and penetrating inward. They cannot act upon habitually clean surfaces or upon surfaces frequently cleaned. They must have more or less permanent lodgment in order to act. The result is that upon these surfaces the beginning of decay is confined actually to the pits, fissures and deep grooves that afford this opportunity for lodgment. Therefore, in preparing them for filling, when strong enamel is reached in the cutting, and no deep grooves are left for the creation of pits beside the finished filling, there is no tendency to recurrence of decay in these surfaces; unless the filling is imperfect in its adaptation to the walls and margins of the cavity.

The conditions of the beginning of decay upon proximal surfaces and the gingival third of buccal and labial surfaces are different in several respects from those beginning in pits or fissures, and these differences call for radical changes in treatment and for a much higher order of judgment. Here we have only smooth surfaces; there are no pits and grooves that serve as special points of beginning. On the other hand, these surfaces are habitually more or less unclean. The proximal surfaces are brought into close contact, or near contact in varying degree, and are more or less so situated as not to be well cleaned by the motions of food over them during mastication. This gives more or less constant opportunity for the continued growth of microorganisms in contact with these surfaces, the formation of films upon them, and the beginning of decay. *The greater liability is in the most unclean portions and modified liability is present as we pass from this toward the neighboring areas of immunity to decay.* Therefore, when decay

has attacked the central portion of this area the tendency is for this attack to continue, spreading upon the surface toward the outer margins of the unclean area. If the central portion of the area be cut out when decay has first appeared, and a filling be made ever so perfectly, the conditions remaining otherwise similar, it will be only a question of time until decay will destroy the remaining portions of the unclean area immediately adjacent to the margins of the filling. This condition forms the basis of extension for prevention, which means simply that when these conditions are found, and they occur almost continuously in proximal cavities in young persons, the whole area of liability should be included within the outlines of the prepared cavity.

In the gingival third of buccal and labial surfaces the conditions are similar, though the forms are different. In the cases in which decays occur in these, the curvature of the surface is such that with the prominence of the gum tissue the gingival portion is not cleaned in chewing food, thus giving the opportunity for the beginning of caries. For this reason these decays are generally found beginning about the age of maturity, or later, when the free margin of the gum has shortened to about its full normal limit. In almost every case in which these decays begin at an earlier age, close inquiry will develop the fact that the patient is not using the teeth with normal vigor in chewing food. We find here a similar central area of greatest liability in which decay acts more quickly; with a lessening of the intensity as we recede from a given center, and with the constant tendency to superficial attack in a widening zone toward the angles of the surface where immunity is usually reached. Here, again, if we prepare and fill the central area of decay early, and make the filling ever so perfect, we will, if the conditions remain the same, soon have recurrence, or the rebeginning of decay at the margins of the filling. Again we should apply the principles of extension for prevention, and in the preparation of the first cavity include the whole area of liability. Any other decays that occur in positions where similar conditions exist should have similar treatment. This expressed in brief the principles of extension for prevention and the classes of cases to which it applies.

A study of the areas of the tooth surfaces which are immune to decay becomes important in this connection for the reason that the extension is for the express purpose of laying the cavity margins in immune zones. The cavity margin must ever be regarded

as the vulnerable point and the effort be made to place it in an immune zone. It is especially important to study the immunity of the axial angles of the teeth with the reasons therefor. For it must be noticed that in all of these cases the extension is toward the axial angles of the teeth as the zone of safety. In doing this, the study of the anatomical forms of the teeth, the relations of the teeth to each other, and to the soft parts; and the relations of all of this to the excursions of food in chewing, is the important point. When these studies are carried out it will be seen that in the act of mastication food is parted by the contact point between the proximating teeth and sweeps through the embrasures onto the sloped surfaces of the gum septum to the buccal and to the lingual and out over and against the axial angles of the teeth. Thus we have habitual cleanliness about the angles, which explains the habitual immunity of these areas. Think over your cases and note how rarely you have seen decay beginning upon either of the four axial angles of the teeth. When decay is seen beginning upon the axial angles of the teeth, or running around them superficially, that person has practically ceased to chew food some time before this has occurred, unless, indeed, some special local cause exists. Then the closer the enamel margins are laid to these angles the better, in both buccal and labial cavities and in proximal cavities whenever the conditions call for extreme care.

It will be seen at once, I think, that this study affects prominently the two classes of smooth-surface cavities under discussion, i. e., proximal cavities and the buccal and labial gingival third cavities. In both of these the direction of the extension is toward the angles of the tooth, and represents the approach to the zone of safety.

I have frequently stated that if a central area of decay is filled and the *conditions remain similar*, recurrence will result. But will the conditions always remain similar? Certainly not. The conditions of susceptibility and immunity are continually changing. Susceptibility to caries is much greater in childhood and youth and the tendency is toward immunity with increasing age; producing marked modification of the susceptibility after the age of twenty or twenty-five years in most cases, and often earlier. The conditions have then become more favorable; and as they improve there is less liability to recurrence of decay when only very moderate extension has been made. For this reason much modification of the extension may be made in the cases of slight susceptibility to

decay, or in persons who have apparently arrived at immunity to the beginnings of decay. The difficulty is to judge of this with our present lack of knowledge of the conditions controlling immunity. The greatest extension is required, however, in children with a strong hereditary predisposition to decay, and the least in opposite cases. But we can never be sure the susceptibility will not recur.

In the treatment of these conditions an error of judgment has arisen in the minds of dentists, as has been mentioned, and which recently published studies should correct, viz., badly decayed teeth have been regarded as poor teeth, poorly calcified, teeth of poor quality, etc. This is in no practical degree true, especially in regard to the portion of the tooth under consideration. There is a difference in the depth of pits and grooves and in the occurrence of fissures in the occlusal portions of tooth surfaces that gives greater opportunity for decay in some teeth and less in others, because of differences in these faults. These are faults due to incompleteness of structure, not faults in chemical structure. Such faults do not predispose the teeth to decay any farther than giving opportunity for its beginning, nor in any degree prevent the teeth from standing well after proper and efficient repair has been made by filling. Such teeth are not poor in quality. If regarded in any degree as poor they are poor by reason of being incomplete in the closure of their grooves; as a matter of fact, such teeth are generally large, strong, with powerful cusps, and otherwise well developed. No such faults of incompleteness of structure are usually present in proximal labial or buccal surfaces. It is purely a matter of position with reference to food excursions in mastication and the fact of failure of cleanliness that causes these surfaces to have areas of susceptibility. This is the basis of the localization of the beginnings of decay at particular points of smooth tooth surface. Otherwise than has been explained imperfect tooth structure has nothing to do in the matter. The teeth of one person are as good as those of another; susceptibility to caries is a matter of environment. It is controlled by the nature of the secretions with which the teeth are surrounded, not by the quality of the teeth themselves.

The qualities of secretions must be sharply divided into localization of secretions or special protection to the growth of microorganisms, and general conditions of the fluids of the mouth; the one giving rise to local decays from purely local causes, while the other gives rise to a general disposition to caries of susceptible areas.

Recently a middle-aged woman presented herself to my clinic with conditions which prominently illustrated the first of these. Neglected decay in early life had caused the loss of a number of teeth in the upper jaw and of several in the lower. The loss in the upper jaw had been supplied by a plate which fitted closely to the necks of the remaining teeth, all of which were decaying badly on their lingual surfaces. In the lower jaw the fillings were standing well, all decay had ceased and the conditions presented were those of complete immunity. In this case the continuous covering of the lingual surfaces with the thick margins of a rubber plate had confined the secretions between the plate and the teeth and protected the growth of microorganisms in that particular locality and furnished the opportunity for the attack. The result was the same as would have occurred if bands had been worn upon the teeth without cement upon the lingual surfaces. The condition of local uncleanness had been made by the dentist. All such must be regarded as giving conditions of extraordinary opportunity, and sufficient to cause decay in the mouths of persons who are immune to the beginnings of decay under ordinary local conditions.

Then whenever we have the near approach of surfaces in such form as to favor uncleanness we have conditions favoring decay, whether these be artificially made or whether they occur through the particular forms of proximal surfaces. It is for this reason that we should generally extend cavities in proximal surfaces so far into the embrasures or toward the angles that approaching surfaces shall be well freed from each other at the cavity margin. The rule that the lingual cavity margin of mesial cavities in bicusps and molars shall be so extended that it may be in view across the median line at the central incisors, and that others should be similarly extended, is a good one.

It is mainly the varying conditions of the fluids of the mouth that make for susceptibility or immunity to caries, with the varying conditions between, and it is to this that attention must be most strongly given in the future. Although decay occurs occasionally under conditions that make explanation extremely difficult with our present knowledge, I believe we can now discern and measure fairly correctly the influence of purely local conditions, and for the most part avoid evil results due to conditions which give special opportunity for the beginnings of decay, by correcting such as may be found to exist and so planning and executing our operations as not

to make others. But the management of the varying conditions of the fluids of the mouth which give susceptibility or immunity is still beyond our control. We can easily note their effects, however, and do much to modify resulting evils by controlling local conditions. General conditions are never so intense as to cause the teeth to decay all over; there are always immune zones of tooth surface in the worst cases of caries, though in some that I have seen every area of tooth surface that has been regarded as in any degree susceptible has been attacked. This, compared with the conditions in which the person goes through life without a spot of decay in the teeth, represents the extremes of susceptibility and immunity.

In those cases in which the evil results of decay are fairly controlled, and vigorous chewing of food is kept up by the patient, the tendency is to more or less complete immunity with advancing age. This is prominent enough for us to anticipate it as the rule in the cases we treat, and we should work to that end. This requires the most radical extension in the cases of extreme susceptibility, in order that the teeth may be protected during its continuance. When the condition of comparative immunity has been reached, or is found to be a characteristic of the particular patient, the extension may generally be less radical. If cases be carefully studied with this in view, much difference may be made within certain limits of comparative safety. And yet it must be remembered that susceptibility often recurs, and that even in cases in which immunity seems fairly established it is still unsafe to depart much from the general lines of moderate extension for prevention.

We often hear it said that such and such teeth have had fillings made without extension for prevention that have been in place for many years, and no recurrence of decay has been seen; the fillings have stood perfectly. Certainly this is true; I have myself seen many examples. In most of such cases immunity to the beginnings of decay has occurred in good time and saved the case from recurrence. If we had the account of the fillings and of the teeth that have been lost from recurrence, the list would be a much longer one. Where there is the least need of filling fillings stand best. Very poor fillings will stand in the mouths that have become immune. I long ago learned not to trust the stories of fillings apparently poorly made which have protected the teeth for thirty and forty years. The teeth would probably have done quite as well with empty cavities; fully as many examples of these that have

remained stationary for years are to be seen in persons fifty and sixty years old. If susceptibility recurs, these old fillings to which I have alluded fail to protect; and the teeth decay as though they were not there. I have recently seen a case of recurrence of decay in one of my own patients for whom I had made fillings, without extension for prevention, that had apparently protected his teeth perfectly for twenty-five years. Susceptibility recurred recently when he was fifty years old, and decay began at the bucco-gingival and linguo-gingival angles of every one of these excellent proximate fillings that had stood for so many years. If I had at first made radical extension in this case the very radical refilling required would not have been necessary. This and similar cases raise the question as to how far we may trust to continued immunity. Observations upon this point have not been sufficient for the formation of such judgment as may be relied upon with safety. The questions of susceptibility and immunity to decay of the teeth are comparatively new in the discussions in dental literature in the broader sense in which I should now consider them. Until more study of them has been made, it is certainly better to make our operations with the view of an ultimate return of a considerable degree of susceptibility than to run the risk of the complete failure that is liable to occur. With more study we may in the future become able to predict continued or permanent immunity with more certainty.—*Review, June, 1902.*

MODELING COMPOSITION. By Dr. Stewart J. Spence, Harriman, Tenn. The following experiments were made with the object of determining: 1st, what is the exact contraction of impressions taken in modeling composition at different degrees of temperature; 2d, whether the adhesion of the composition to the impression cup prevents or otherwise affects this contraction; 3d, whether a high heat of the composition is necessary in order to prevent a retraction (after withdrawal from mouth) of parts of the impression stretched in taking the impression; and 4th, whether an impression dragged out of form while being removed from the mouth will by retraction resume its proper shape.

As results of these experimental inquiries, it was found: 1st, that this excellent impression material contracts about 1-35 of an inch in six inches in falling from 110 to 35 degrees Fahr.; 2d, that the adhesion of the material to the tray has no perceptible effect on

this contraction; 3d, that a high degree of heat in taking the impression is not necessary to prevent subsequent warpage of the impression; and 4th, that its elasticity, even when the impression is tolerably stiff, is not sufficient to cause impressions when dragged in removal to fully resume their correct forms.

The experiments were conducted thus: *Experiment 1.* To determine the contraction of modeling composition in cooling. Modeling composition was heated and then pressed into the lid of one of the metal boxes in which vulcanizable rubber is supplied to dentists, this being, as we know, nearly six inches long. It was then cooled, and was next immersed in warm water, with just sufficient of one end projecting from the water to permit of watching its expansion and contraction. A thermometer was also placed in the water. Under the influence of the heat the composition was seen soon to expand, creeping up to its original position, so that by the time it had risen to 110 degrees it was once more in contact with the end of the lid. On the temperature being raised to 115 degrees the composition became quite soft. The heat was now turned off, and the process of cooling was commenced by adding cold water to the hot. During reduction of temperature the material began to exhibit a very slight contraction at 100 degrees. This contraction was perceptibly increased when a second addition of cold water reduced the temperature to 90 degrees. At 80 degrees the contraction was correspondingly increased, and at 70 degrees it had proceeded so far that there was a space between the composition and the end of the lid, into which three thicknesses of paper could be inserted. At 60 degrees the shrinkage admitted four thicknesses of paper, and at a point a little above freezing it admitted seven. Now, this gave about 1-35 of an inch as the contraction of six inches of modeling composition, in passing from 110 to about 35 degrees F. This would be nearly 1-105 of an inch in an impression measuring two inches; less than 0.25 millimeter.

Even if all of this contraction were reproduced in a plate, it would probably have only a beneficial effect on its adhesion to the membrane in soft mouths, but as the model is taken from the impression usually when the latter is at about 70 degrees F., the contraction above mentioned must be reduced by half, making it about 0.12 millimeter. When it is considered that the expansion of the least expansive kinds of plaster is not less than 0.35 millimeter in two inches, this feature of contraction is seen to be one of the main

virtues of modeling composition. (The writer uses a plaster treated to prevent expansion, and speaks of commonly existing conditions.) To test the expansibility of beeswax, "sticky wax" and paraffin wax, experiments similar to the above were made in pure beeswax, also in the paraffin wax put up by the Standard Oil Company, and in the composition sold as sticky wax. The beeswax was found to have about the same contraction as modeling composition, while sticky wax seemed to have a trifle more. The paraffin showed great contraction, about 1-16 of an inch in the length of six inches. This contraction of wax should be remembered in waxing up plates, bridges, etc., and in waxing together broken parts of plates, the operator holding the parts, if movable, in place till the wax is cool, to prevent their being drawn out of position by its contraction.

Experiment 2. To determine the effect on contraction of adhesion to tray. As modeling composition is somewhat disposed to loosen from the impression cup in places during withdrawal of impression, it has been my practice, and probably that of others, to stick tray and material together by holding bottom of tray over an alcohol flame, then chilling this heated region before placing the impression in the mouth.

Knowing that resistance to expansion will cause warping of plaster casts, it occurred to me that the resistance to contraction offered by this adhesion of the composition to the tray might cause a somewhat similar warping, or at least prevent contraction. The first test was made thus: Softened composition was pressed into the before-mentioned lid, filling it, and the two were then stuck together by the alcohol flame, and cooled in cold water. It was then seen that, despite the firm adhesion of the composition to the lid, the usual contraction had occurred in cooling, for though the material remained firmly adherent to the metal, it showed the space at the ends. Neither did it bulge nor warp, for after being forcibly torn from the lid, on being placed back there it sucked to the lid enough to lift it.

A second test was made thus: An impression cup was filled with softened composition, and into this was pressed an old plaster model, then withdrawn, thus producing a condition similar to an ordinary impression of the upper jaw. The alcohol flame was then applied to the tray to produce adhesion. The object now was to see whether the buccal surfaces of this impression would contract toward each

other, or whether they would remain so adherent to the tray as not to approach each other during the cooling of the composition. To accomplish this, two flat-headed tacks were stuck into the buccal surfaces of the impression, so that their heads faced each other across the palatal surface. A little stick of orange wood was then cut to the length of the space between the two tack heads, so that when placed end to end against them it was held by them in place with just sufficient pressure to prevent it falling away. Then, without wetting the stick, the impression was chilled, and it was found that so tightly was the stick held by the tacks, due to the contraction of the modeling composition in cooling, that the whole case could be lifted by it. These two experiments seem to show satisfactorily that adhesion to tray has no influence upon the warpage or contraction of modeling composition impressions.

Experiment 3. To determine whether the elasticity of modeling composition is enough to cause impressions to lose shape by retraction after withdrawal. A year or so ago there appeared in several of the magazines an item advising high heating of composition in taking impressions, in order to avoid a tendency of the material to retract as soon as the pressure on the impression is withdrawn by its removal from the mouth. This matter was tested thus: A roll or rope of the composition, about three-fourths of an inch thick and about a foot long, was made by heating two cakes of it to 120 degrees F. and rolling them together. A board was then taken, with cleats nailed down on its face at either end, leaving a space of thirteen inches between cleats. This rope of composition thus heated was stretched to reach from cleat to cleat, when, on being let go, it retracted a mere trifle—about four thicknesses of paper. It was next allowed to cool until its temperature was lower than is ever used in taking the impression, perhaps 95 degrees F., when it was doubled up and again rolled into a rope and once more laid between the cleats, stretching it to reach them as before, when, on being released, it immediately retracted about one-fourth inch. These two experiments demonstrated that there is greater elasticity in this material when warm than when hot, but not much in either case. A third test was thus made: It was again doubled (without reheating) and again rolled and stretched between the cleats, and a strip of wood was laid along it and held there by slight pressure for forty seconds. In this case no retraction occurred, neither during nor after removal of the pressure. This demonstrated that its elas-

ticity would be overcome by the pressure maintained by the operator in holding the impression in the mouth, even were it used much colder (and therefore more elastic) than it ordinarily is used. (The reader must not confound this retraction with contraction.)

Experiment 4. To determine if the quality of retraction in modeling composition is enough to cause impressions when dragged out of shape while being withdrawn from the mouth to resume their proper shape. It has always seemed to me that two or three minutes is hardly sufficient time to allow for the stiffening of modeling composition impressions in the mouth, and that when then taken out they are very apt to be dragged out of shape either by pressure against the cheeks or lips or by adhesion to the palate. By heating a lump of this material to 110 degrees F., and then removing it from the hot water and pressing the bulb of a thermometer into it, I found that it required (with the surrounding temperature at 70 degrees) no less than eight minutes for the heat of the lump to fall to 98 degrees. At this temperature it is quite stiff enough to be removed from the mouth without bending. But it is probably often withdrawn when no lower than 105 degrees, at which temperature, as the following tests show, this material has but little tendency to return to any form from which it has been dragged.

The rope of composition was again used, heated to 110 degrees F., rolled out and stretched on the cleated board, with a thermometer imbedded in its center, and allowed to fall to 105 degrees. At this temperature one end of the rope was bent upward, then let go, in order to test its power to resume its old position. This it quite failed to do, returning only about one-fourth the distance it had been bent. The other end was then taken and stretched, but on being released it shrank back only about one-fourth the distance it had been stretched. The rope was then allowed to fall to 100 degrees F., when these trials were repeated with more favorable, yet anything but perfect, results.

These two last experiments seem to teach that it is not necessary that modeling composition be very hot when placed in the mouth, but that it should be allowed to thoroughly cool before being withdrawn therefrom. As, however, it can perhaps never be known with certainty when dragging does not occur at the palate, it is safe practice to return it to position, after partial withdrawal, and hold it there for about half a minute.

But while it is not *necessary* that modeling composition should be

very hot when placed in the mouth, this is true only when sufficient compression can be made against the labial and buccal walls to overcome the tendency of the impression to fail to hug the upper portions of these walls, which tendency is greatest in the least heated material. If the reader will try this experiment by forcing a plaster model into composition held in an impression tray, he will observe that the material rises considerably higher than where it actually touches the model. By curving his middle finger and palm of hand around this portion, he can press it easily to place, but it does not tend of itself to assume correct position. Therefore, it is well to insert the material while quite hot and soft, when this tendency is least, and also when the ridge can be forced deeply into the tray and the support of the tray's flanges given to this critical portion of the impression.

Dr. W. H. Atkinson taught that there is an undesirable tendency in impressions, especially those taken in modeling composition, to force upward the membrane along the upper labial and buccal surfaces, where it passes from jaw to cheek, and so tighten that portion of it which ought to lie on the jaw as to give a defective impression—an impression of the stretched membrane instead of the jaw. To remedy this, he recommended the cutting away of all excess of the impression, slightly reheating and reinserting it. He had probably observed the tendency of composition to fail to hug the upper portions of the labial and buccal surfaces, attributing it, however, to other than the right cause, as I think. His remedy, however, appeals to one's judgment as good, though unnecessary perhaps if the simpler ones above mentioned are employed; still it is worthy of mention.

My paper, though direfully lengthy, has by no means exhausted the study of modeling composition. I have made no experiments to show whether this material compresses the soft parts more than does moderately stiff plaster, still less whether such compression is beneficial. Dr. Haskell, I think, believes it is not. Nor have I been able to experiment on the results of taking the model from the impression at various degrees of temperature, as affecting tightness of fit, which I hope to be able to do, for it would be very interesting to know how far contraction is beneficial, if at all. One thing may be said in this connection. Contraction of impressions proceeds from circumference to center, therefore a plate made from a contracted impression would (assuming that the model remains un-

changed) press hard against the buccal and labial surfaces, but be drawn away in the direction of the center from the walls on the other side of the ridge—the sides of the palatal arch. If this be so, it would seem that better results might be obtained by varnishing a non-expanded plaster impression with several coats of varnish, and thus obtaining a uniform reduction of size in the model.

The temptation, because of cost, to use the same lump of modeling composition in different mouths, and the difficulty of rendering it aseptic, is another phase of the subject which presents itself for the serious consideration of the profession.—*Items, May, 1902.*

ALOPECIA OF DENTAL ORIGIN. At the meeting of the Paris Society of Dermatology and Syphilography, M. Jacquet (*Lancet*, June 21, 1902) showed a patient who had been attacked by alopecia areata after having suffered from bilateral facial neuralgia. M. Jacquet had treated the alopecia without success, and eventually discovered that his patient had three carious molars. A dentist was called in, and extracted two teeth and filled a third. Three days later the neuralgia which had lasted for one year had quite disappeared. Twelve days later the patches of alopecia which had been perfectly bare were covered with hair.

M. Galippe, without wishing to criticize the theory proposed by M. Jacquet as to the dental origin of alopecia, reminded the meeting that so far no dentist appeared to have been struck by the coincidence of alopecia with dental lesions. For his own part, he had never seen a case.

M. Du Castel related the case of a lady who had consulted him about two patches of alopecia on the nape of her neck. A short time previous to their appearance she had had a tooth filled, and the dentist had omitted to place a clean napkin under her head. She considered that she had caught the infection from the head-rest. Now was this a case of contagion, or was the alopecia the consequence of dental operation?

M. Brocq related a case in support of M. Jacquet's contention. It was that of a little girl who had come under his care some months ago for alopecia. During the first three weeks of her treatment nothing was done to her mouth, and the patches of alopecia markedly increased. Now, however, her teeth are being carefully attended to, and while no new patches have developed, the original patches have lessened in size.

Letters.

DOCK MEASLEY LEARNS THE BOSS ANOTHER LESSON.

(AS TOLD BY THE OFFICE BOY.)

The Boss he's got so that he don't Haf Attend to his business, what with running after Dock Measley. Once in a Long While Dock Measley he'll kind o' look in at our Offis, to show he ain't Proud, an' to kind o' Encourage the Boss, I reckon. Sometimes he'll open the Boss's instrument case, an' look over his Tools an' tell him what kind he Orter Have, an' sniff. They's one thing about Dock Measley that the Boss says he can't noway Make Out: he's the only Young Dentist he ever knowed, that didn't make Three Hunderd Dolers, the first month he was in practice. Why it is that mos' every Young Dentist makes jis' that amount o' Money the first month, no more an' no less, the Boss says is one o' the Inscrutable Mysteries o' Providence that we hadn't orter presume to Pry into. He says our Finite Minds isn't capable o' Graspin' it. It's one o' the Stupendous, Overwhelmin' Paradoxes of Nature that utterly confounds human intelligence, like the Thirty an' Forty Thousan' Doler Incomes of the New York an' Chicago Dentists, that keeps a-pilin' up while they're off attendin' Dental Conventions.

The Boss he says he wouldn't want anythin' said about it, but he's kind o' Suspicioned of Late Years that some Dentists tells Sky-Scraper Stories about their incomes. His sayin' that reminded me about the time once when him an' Dock Peabody was talkin' about business, an' they'd both jis' took a Big Dose o' that Pokeberry Tonic that the Boss keeps in our Hall Closet, an' he said I mustn't never Taste it, fer it's Pizen without you're Growed Up. So then they got to talkin', an' says Dock Peabody, "Yes, I admit things isn't Rushin' with me, at least not Collections. I done tollable good in the Laboratory las' month, but I didn't Take In only Four Hunderd an' Twenty Dolers." The Boss he Winced, but d'rec'ly he Riz to the Occasion. Says he, "I don't call that so Offul Bad. I only Took In Four Hunderd an' Eighty-Seven Dolers myself" (like he thought Dock Peabody hadn't orter be Discouraged, comin' so near Ketchin' Up with him). Then Dock Peabody he looked Grumpy, an' in a minute he said he'd got to be a-goin', 'cause he'd

got four Big Bridges an' two partial Gold Sets to make that day. So when he'd Went the Boss he emptied the Bottle o' Pokeberry Juice, an' he Smiled sarcastic like, an' says he, "James, when you git to be a Dentist you mind One Thing, you keep your Best Assortment of Lies fer your Patients, not fer other Dentists. Mos' dentists ain't got a bit o' Tact about their Lyin'." Then two days later I ast him would he let me have Two Dolers on account, an' says he, "James, I'm Offul Sorry, but I'm bein' Punished dreadful fer that Lie I told Dock Peabody about takin' in so Mutch Money las' month. It seems like I ain't ever a-goin' to see another Doler agin."

Jis' then the Bell Rung, an' that broke the Spell. I seen it was a New Patient, a Lady. I called the Boss, an' he come a-hurryin' in, givin' it away in Big Head-Lines that a new patient didn't Happen to us mutch oftener than a Eclipse of the Sun. The Lady she said she'd got a Big Lot o' Work to be done, an' she'd been waitin' till she had Plenty o' Leisure, so the Dentist could do the case Full Justice. So the Boss says he, "You certainly have come to the Right Offis, no mistake, an' I always try to be Reasonable in my Charges, an' I've got the reputation of bein' Gentle an' Painstakin'." Then he looked at her Teeth, an' says he, "They is, sure enough, a Lot to be done here. I hadn't orter be ast to set no price in advance, but bein' as it's you an' you ain't accustomed to Dentists' Charges, I'll do this Job fer Twenty-Three Dolers, an' it orter be Thirty Dolers, at a low estimate." The lady she looked kind o' Supprised, I thought, an' she didn't say nothin'. So then the Boss he considered a minute, an' says he, "I don't very often name a Price an' then come down from it, but I'll throw off Three Dolers, ef you reckon that would Suit you better." Still the Lady she never said a Word, only set there kind o' Studyin' the matter over, so then says the Boss, "Say we make it Eighteen Dolers fer the Whole Job, an' ef you can't pay all at once, you pay me Four Dolers the first settin', an' the balance when it's mos' Convenient." Then after another minute of waitin' says he, "Them terms is Offul Cheap, the way Dental Supplies costs jis' at Present." I was gittin' turrible out of Patience with the Boss, fer I reckoned he would come down to nothin' at all, an' throw in a bottle o' Tooth-Powder, without she'd say somethin'. But she never said nothin', only set there ponderin' it over, an' then says the Boss, "If you'd like to wait a week I'm a-lookin' to see the Price o' Dental Supplies go down, then mebbe I'll be able to do still better. You think it over, ef you ain't

Satisfied." So the Lady she said she'd consider the matter, and went away.

The nex' Mornin' the Boss sent me over to Dock Measley's offis to ast him would he let him come over an' see him Operate, 'cause Dock Measley'd said he'd be glad to Learn the Boss some Late Tricks about Fillin' Teeth. Dock Measley he's got a Offul Purty young lady what's a Perfessional Stenographer in his Offis, an' she ain't reely his Offis Girl, but she's got a Desk in his Reception Room, an' she helps Tend Door, an' lets him kind o' Saas her, an' Order her Round when Patients is Present, instid o' Payin' him Rent.

Well, they was a Lady talkin' to this Young Lady when I went in, an' she ast, could she see the Dentist. The Young Lady said yes, when he wasn't so Offul Busy. Then she done a Curious Thing, she Snuck out an' she Brung In through the Back Hall a Young Girl what was settin' by the Kitchen Winder, an' she had her Set Down in Dock Measley's Chair. She Set There about twenty minutes, chawin' gum, an' Dock Measley eatin' Peanuts. Then Dock Measley he opened the door into the Reception Room, an' says he in a Loud Vois, so as Everybody could heer, "I'm so Drove, jis' at present, that I can't give you another Appointment fer Three Weeks." So the Young Lady says she, "I'm sorry, but I reckon I'll haf to Wait. Now I always Pay as I Go, Dock; how Mutch is it fer This Fillin'?" An' Dock Measley he says, Most Offul Composed, "Twelve Dolers, please." Says she, "Is that really enough, Doctor? You've been nearly an Hour filling the Tooth, an' you've hurt me so little that I feel like you'd orter have something Extry for that." But Dock Measley he insisted Twelve Dolers was about right, so the Girl she rattled some Keys together, like it was coins, an' she said, "Thank you, Doctor, I shall take pleasure in recommending you to all my Friends. Good Morning."

Then jis' as she was a-goin' I seen Dock give her a Nickel on the Sly, an' wink, an' I reckon it was to Pay her fer the Trouble. So she went in the Reception Room an' put on a Hat an' some Gloves layin' on the Hat-Rack, an' went out the Front Door. (About three minutes later I seen her through a Back Winder a-peelin' Pertaters in the Kitchen.)

So then Dock Measley he went in the Reception Room, an' he looked Supprised when he seen the Lady, but he spoke offul soft an' Respectful, an' said somethin' about supposin' it was another Lady, like as if he'd got an Appointment with somebody else right

away. I looked at the Lady jis' then, an' it seemed to me she looked Mighty Like the one that had been in our Offis, the day before. The more I looked the more I was almost Sure it was the Same One. Every little bit, while he was a-talkin' to her, Dock Measley he'd excuse himself a Minute, an' he'd turn round toward the Young Lady poundin' on her Type-Writer, in a Corner, an' he'd Dictate a sentence or two, like she was his Amanuensis. It was some-thin' about how he was Deeply Sensible of the Honor the Association proposed to Confer on him, but all the same he was wishin' the Committee had turned their attention elsewhere, when it came to namin' a Suitable Candidate fer President of so August a Body as the American Dental Association. But ef the Committee felt that it was his Duty to accept, why he hadn't nothin' Further to Say, an' ef he was elected, he'd try to Serve to the best o' his Ability, an' at any sacrifice o' Time an' Expense in attendin' the Convention.

I was completely Took Aback when I heered that, for I was Peekin' over the Young Lady's shoulder an' I seen she wasn't payin' No Attention to his Polly-blatherin', but was copyin' a Paper about some Lawsuit. I was a mite Disappointed in Dock Measley, 'cause he'd always seemed above them kind o' Tricks, so when I got a Chance I spoke to him about it. Dock Measley says he, "James, everything is Fair when it comes to makin' a Favorable Impression on your Patients, 'cause they like dentists that appears Important, but it's in Bad Taste fer a dentist to toot about his importance to Other Dentists, an' a dentist that'll do that ought to have his head Chopped Off with a Monkey-Wrench."

So then Dock he give his attention to the Lady, an' I didn't heer all they said, only after he'd looked in her Mouth he said, "I reely do not care to venture any opinion as to what this work will cost you, madam. It will certainly not be less than Eighty Dolers, an' it might be a Hundred, or even more. To be frank with you, I expect to be liberally paid for my services, and I do not aim to attract to my office people who feel that they must count the Dolers. I cater to people of ample means, as a rule. Pardon me for this plain speaking. Let me say, however, if you feel that my rates are beyond your means, I can refer you to a worthy young Dentist who will do Good Work for you at much lower rates than I can afford."

After that it seemed like the lady wouldn't be Drove Away, an' says she, "I want only the Best Work by the Best Dentists, an' ex-

pense ain't only a Secondary Consideration." So then she made an Appointment. I got a Good Look at her, an' I seen sure it was the Lady that had been in our Offis the day before.

Dock he told me to have the Boss come prompt at Two O'clock that afternoon an' he said he'd got a Interestin' Case that would Learn him a Heap. The Boss he said it would be a good chance fer me to Learn somethin', too, an' I'd better go 'long. Dock Measley he'd already got the Dam on the lady's mouth, an' he showed the Boss how he annealed his Gold, an' tied ligatures, an' in short, how he done everything, an' you'd 'a' thought the Boss was a Freshman in College, the way Dock Measley treated him. I looked to see him git Bilin' Mad, but he didn't. The lady she acted Offul Strange; she kep' her handkerchief over her Eyes all the Time, like they was Weak. What with that an' the Dam over her Teeth, you couldn't tell what she looked like. The Boss he was so Interested that he went again the Nex' Day, an' he kep' on a-goin' till Dock Measley Finished the Job. He was nearly three days in all, doin' the work.

The Boss he noticed the Lady was Offul Bashful, an' she wouldn't never consent to him a-comin' in the Operatin' Room till the Rubber Dam was all Fixed and her Eyes covered up. As the Boss said to me afterwards, they was somethin' Mysterious about the whole Shootin'-Match. I never Left On, for I reckoned it wouldn't do to tell him what I Suspicioned. An' it wasn't explained until about a Month Later, when Dock Measley he come in our Offis an' he showed the Boss a check fer a Hunderd an' Forty Seven Dolers, as us three was a-goin' out together. "That's my Pay fer that Job you helped me on," said he. "What Job?" said the Boss. "Why that Mrs. Frazier, the one I was workin' for three days, an' you a-watchin' how I done things," says Dock Measley. "Oh, yes," says the Boss. "That was a Big Job, but you got good pay fer it."

"You bet I did. Some men would of done that Job fer Forty-Five Dolers," says Dock Measley, kind o' Sneerin'. "Lots o' Dentists ain't got the Least Idee what their Services is worth. I bet there's men in this very Town, would undertake to do sech a Job as that fer Eighteen Dolers." "I expect so," said the Boss. "Mighty nice woman, Mrs. Frazier is, but kind o' Funny about some things. Fer instance, she wouldn't hear to me lettin' you come in where I was at work for her, without she'd got her face all covered up. Eccentric, as you might say." "Oh, very," says the Boss. Dock Measley give a Sudden Start. "Say, there she goes this very min-

ute, Over across the street. The woman with the Blue parasol." The Boss he looked, kind o' careless, then all of a Sudden his jaw Dropped, he turned White, an' his Knees shook. "That—that wom—woman, that wo—woman, over there, did—did you sa—say!" he stammered. "Why—why that's the same—the same woman that came to see me about all that work. I offered to do it for—for Eighteen Dolers, myself. You'd heered that somehow, Dock Measley. You're jokin' Fun at me, Sir!" He was gittin' pretty Mad by this time. Says he, "An' you let me come an' Look On while you done *my* Job, an' you let me ast you a lot o' Fool Questions about how to Do things, like I wasn't only a Novice! Dern sech Friendship, Sir!"

The Boss he would of Hit Dock Measley with his Umbrella, right in the Open Street, I reckon, but as luck would have it, Dock Measley slipped on a Orange Peel jis' then, an' went down anyhow. He was pretty Badly Sprained, so the Boss he had to help him in a Drug-Store instead. But after he'd told the Druggist to look after him, he went out, never even sayin' good bye. After him an' me had walked four squares, neither one of us speakin' a Word, says he in a Sad Vois, "James, I give you Leave anytime you Kin, say fer a Month to come, to Sock me one behind the Ear, with anything handy. You watch out an' when I ain't a-lookin', give it to me. I reckon a Big Cabbage would be nearer to bein' Adequate to the requirements of this case. Mebbe I'll git mad an' Cuss, but don't let that Hender you, James. I hope I don't appear Conceity, James, but ef there's another as big a Fool in the Perfession as I am, I ain't never Heered of him. I claim to be in a Class by myself."

Cincinnati, O.

FRANK W. SAGE, D.D.S.

THEOLOGIAN'S JOKE ON THEOLOGY.—Around the table sat four college-bred men—a lawyer, a physician, an electrician and a theologian. There arose a dispute as to which of the sciences was the oldest. "Jurisprudence, of course," said the lawyer. "That was known already in Paradise, for Adam and Eve were evicted." "Oh, no," said the physician; "medicine is, without doubt, older. Just remember the operation performed on Adam for the possession of the rib. That was before they entered Paradise!" "You are both wrong, gentlemen," said the electrician; "the palm belongs to us electricians, as before anything else existed there issued forth the command: 'Let there be Light.'" "I do not wish to appear boastful," then spoke up the theologian, "but I believe the priority belongs to us, for before there was light there was darkness."

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Editorial.

EXTREMES IN DENTAL PRACTICE.

Looking back over a period of thirty-five or forty years, there will be remembered many extremes in methods of practice which have generally been started by the leaders of advanced movements in dental practice. And whether correct and beneficial, or resulting in evil, almost always at the outset these new departures have been carried to too great extremes. Even such movements as have later proved beneficial and enduring have in all cases needed modifying at the start.

Among the first of these radical measures which impressed the writer in early practice was pulp capping. Then the capping of exposed pulps was advocated in extreme cases by the leading men of the dental profession. Even in cases where the pulp was exposed, and the patient had suffered considerable toothache, its treatment and capping were advocated, and even surgical procedure was advised, such as cutting a V and bringing the flaps together to lessen the size of the pulp and prevent its pressing against the ragged walls, and then to cap it. The question of pulp capping was one of heated discussion for years, but with the lapse of time moderation prevailed.

About the same time radical separating as a preventive of caries was practiced by the great majority of the profession. It was a common procedure to make wide separations between all the teeth, especially the molars and bicuspid, which were mutilated with V-shaped separations. This was persisted in for several years until the evil results became apparent to everyone, when the practice was entirely discontinued.

It was but natural, with the teeth of the community thus mutilated, that extreme contouring should follow close in the wake of this radical separating, and that cohesive gold should be used to a great extent. With this came the almost universal practice of condensing the gold by mallet force. Heavy gold also came into use,

running from No. 30 to No. 240, although No. 60 was generally used. For years thin gold, say Nos. 3 and 4, was not employed, so the usefulness of noncohesive gold was entirely ignored. These extremes in the use of cohesive gold have become somewhat modified, yet we incline to the belief that the value of noncohesive gold in proper places is not recognized as it should be. It is not our intention to discuss here the use of noncohesive gold, but we wish to describe one place in which its employment is always beneficial, namely, complicated approximal cavities between molars and bicuspid. A sheet of No. 3 or No. 4 noncohesive foil should be made into a ribbon, which should be rolled on a broach into a cylinder, and the length of same when in position must be a little more than the depth of the cavity at the cervical margin. The last of roll may be made cohesive if desirable. With such cylinders the first one-third or one-half of these approximal cavities may be filled in one-tenth the time necessary when cohesive gold is used, and a much safer operation can be made. The balance of the filling can then be made with cohesive gold. We have repeatedly described this procedure for the filling of these difficult cavities, believing there is nothing that can take its place, but the method seems too sure and simple to be fascinating, hence but few adopt it.

The next great extreme in practice was crown and bridgework, and while this was terribly abused and brought into disrepute, the growth of both crown and bridgework during the last few years demonstrates the fact that they have come to stay.

There are more recent extremes in practice, but they have not been in vogue long enough to demonstrate just how far they will be carried or how much they will be modified. One of these is porcelain inlays. This line of work has been brought to great perfection, and certainly has a permanent place in practice, yet we think it is being carried to an extreme and will be modified as time proves its weak points.

Another radical measure that is being advocated, perhaps not so generally, but which is growing, is that of destroying the pulps of teeth for the prevention of loss of the sockets. In the last two or three years we have read in the journals and have heard in dental meetings educated men advocating the destruction of the pulp as one of the lines of treatment of this little understood and baffling disease of the oral cavity. That almost any suggestion for an improvement in the treatment of this difficulty should receive atten-

tion is not to be wondered at, but unless we are very much in error in regard to this many-named disease, destroying the pulps of the teeth affected will not become very general. The statement is made that teeth usually become at once firmer after the pulp has been removed, and that if the pulp were destroyed early in life it would prevent much of the loss of the sockets of the teeth, and the periodontal membrane would be strengthened. Baffled as we are in the treatment of this difficulty, we are at any time ready to listen to arguments in favor of such procedure as promises more certainty of permanent results. But we certainly ought to have more proof than has been presented up to this time before adopting such a radical measure.

Without having gone into a thorough investigation of the subject it would be folly to assert the truth or fallacy of the theories advanced, but a careful examination of the teeth, pulpless or otherwise, in numerous mouths where the disease in any of its various forms is prevalent, will give some data by which to get at the truth. If in such examination the pulpless teeth generally show a tendency to be less affected than those with live pulps in the same mouth under similar influences, then with such facts established we are better prepared to affirm or reject the claims made by the advocates of this line of procedure. We shall, however, be surprised if exactly the opposite is not found to be true, namely, that the pulpless teeth are much more affected and sooner lost than those with live pulps.

We will consider only one other extreme at this time, viz., extension for prevention. This is receiving a fair share of attention from active disputants. Not more, however, than the importance of the subject deserves, in fact, the theories advanced, and the line of procedure advocated under the head of extension for prevention as a remedy for the failures of fillings, involve so many complicated questions that a careful study of the whole question of dental caries must be made in order to decide on proper lines of procedure. Therefore, no more important subject has been brought to the attention of the profession in our day. Yet when reading or listening to the discussions which have taken place recently we have been impressed with the feeling that either there was a lack of careful study by the speaker of the conditions under which caries takes place in the mouth, or else he wanted to criticize someone. At least there seems to be a lack of desire to get at the facts. As a sample of the way this subject is treated in discussions by those who are

opposing it, we would call attention to some points of an editorial which appeared in the *Items of Interest* for September. The editor, after some kind words of commendation of an article by Dr. Black, which is published on page 773 of this issue, makes what we consider unfair and illogical criticisms. In speaking of the tendency of decay to spread superficially on areas of susceptibility, and the tendency to recur about the margins of fillings, he says, "But Dr. Black does not tell us why this recurrence is at the margins of the fillings. Why not elsewhere in that region which is prone to decay, and why not as a distinct new cavity, independent of the filled area." Now this has been a perfectly simple proposition. If decay begins at the center of a given area, and its tendency is to spread superficially toward the margins of that area, certainly if the central portion is cut away and a good filling is made the greatest tendency to recurrence of decay is exactly next to the margins of that filling, because that portion close against the margins is the portion that would be next attacked in the process of spreading. The mental process in following this proposition is quite akin to that by which one realizes that two and two make four. Dr. Ottolengui's "why not as a distinct new cavity, independent of the filled area," is a different proposition. If it is independent of the filled area it has nothing to do with the case in hand, we do not place fillings in occlusal surfaces to prevent decay of lingual surfaces, nor in mesial surfaces to prevent decay of buccal surfaces. The editor seems to have ignored Dr. Black's first propositions in the article quoted, in which he defines on page 774 "recurrence from leakage," "and a new decay that has started in the enamel beside the filling." Both are distinctly in the area of liability in which the filling is placed, not in an independent area. Such decays have been known and described as *recurrence* of decay from time immemorial.

Next Dr. Ottolengui tells us that decay upon the labial surfaces of the incisors is usually upon the highest part of the curve of the tooth, "the place of all others in the mouth reached most often and most thoroughly cleansed by the tooth brush." Instead of this last clause, which we have quoted, he would have explained, had he examined these cases more carefully, that while it is upon the highest part of the curve of the tooth, mesio-distally, in the other direction, or inciso-gingivally, the decay begins close to the free margin of the gum, the place of all others that people oftenest fail to cleanse properly with the tooth brush unless they have been especially trained to

its use in that locality. He should have seen also that in these cases there is generally a fullness of the gum tissue, if not an actual swelling of the immediate gum margin, which with its curve from mesial to distal forms a kind of pocket which prevents this particular area from being cleansed by the ordinary motions of food, lips, etc., in chewing. In this condition a person will ordinarily touch these points very lightly with the brush or avoid them altogether. Besides this, in a great many mouths the rigidity of the muscles in this region often makes it quite difficult for the patient to reach these danger points. They are, however, surfaces that can be kept clean with the brush when he has been trained to the proper use of that instrument, but when this tendency has been developed the attainment of success allows of no neglect.

The editor of the *Items* is again illogical in discussing the question of small proximate fillings versus large, and says regarding the coming of immunity, or changes for the better with age, "and even in young mouths the extension is made because the conditions may not change for the better." It would be more sensible to say that in young mouths it will be longer before we can expect changes for the better. Further on Dr. Ottolengui says, "There must be a reasonable number of patients in whose mouths the conditions do remain the same; indeed, there should be a majority of such instances to establish the practice." Here we need only to ask who is willing that a majority of his fillings shall be known to be falling to pieces before he will seek to amend his plans. Then passing on Dr. Ottolengui speaks of the success some men have had with small approximal fillings, and winds up with this astonishing remark, "At least they should have met an *appreciable* number of failures, if recurrence around small fillings is to be seriously apprehended." (Italics ours.) Certainly we have little to say to those who fill teeth and do not meet with an *appreciable* number of failures, no matter what their plan of operating. We feel like quoting Paul when he says, "He who (filleteth teeth) and sayeth he (faileth) not is a ———," but we refrain.

The practice of extension for prevention by the inexperienced and incompetent, both as regards observation and manipulative skill, is apt to be harmful many times to the patient. To carry out this practice, and to know when and where it is going to be advantageous in preventing recurrence and failures, requires the best of judgment and experienced observation as to the different appearances of

mouths which indicate whether or not decay is likely to recur if the cavity is not extended beyond the danger point. But with such skill and knowledge as can be acquired only by personal observation the cases where this extension is indicated can be decided upon with a reasonable degree of certainty. While our plan of operation has been what might be called radical extension, we have nevertheless had many failures and recurrences of decay beyond the fillings, where if the extension had been a little farther, as described accurately by Dr. Black, the failure of what was otherwise a perfect operation could have been avoided.

Notices.

NEW JERSEY STATE EXAMINING BOARD.

The New Jersey State Board of Dental Examiners will hold its fall meeting for examinations Oct. 21-23, 1902. Further information may be had of the secretary, J. Allen Osmun, 588 Broad St., Newark.

SOUTHERN ILLINOIS DENTAL SOCIETY.

After some years rest this society will hold its next annual session at Alton, Oct. 14-15, 1902. All are cordially invited to be present. There is promise of an excellent program and a good time.

C. B. ROHLAND, Secretary, Alton.

MINNESOTA STATE DENTAL ASSOCIATION.

The Minnesota State Dental Association closed its annual meeting at St. Paul, Sept. 4, 1902, and elected the following officers: President, S. R. Holden; vice-president, A. M. Lewis; secretary, George S. Todd; treasurer, H. M. Reid; chairman executive committee, J. M. Walls; master of clinics, J. O. Wells.

LATEST DENTAL PATENTS.

- 707,810. Form for holding teeth, R. J. Wenker, Milwaukee, Wis.
- 707,912. Fountain spittoon, C. M. Freeman, Baltimore, Md.
- 708,772. Gold annealer, C. F. Lauderdale, Milwaukee, Wis.
- 708,811. Machine for casting bridges, M. W. Hollingsworth, Philadelphia, Pa.
- 709,410. Dental bridge-work, J. L. Kelly, St. Paul, Minn.

ILLINOIS STATE BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Illinois State Board of Dental Examiners, for the examination of applicants to practice dentistry in the state of Illinois, will be held in Chicago, Oct. 17-18, 1902.

A recent opinion of the attorney-general specifies the following as being eligible to take the examination before the Board: "Anyone holding a

medical diploma from a reputable medical college; anyone who has been a legal practitioner of dentistry for ten years prior to removing into the state."

All applicants must come prepared with instruments, rubber dam, and gold to perform practical work.

The examination fee is ten dollars. Any further information can be obtained by addressing the secretary.

J. G. REID, D. D. S., Sec'y, 1006 Champlain Building, Chicago.

NORTHERN ILLINOIS DENTAL SOCIETY.

The fifteenth annual meeting of the Northern Illinois Dental Society will be held at Rockford, Oct. 15-16, 1902. A splendid program has been prepared, and members of the profession are cordially invited to be present. Rockford is an excellent meeting place, and a good and profitable time is assured. The dues are only one dollar per year, and over thirty new members were taken in at the last meeting.

J. J. REED, Secretary.

NORTHEASTERN DENTAL ASSOCIATION.

The eighth annual meeting of the Northeastern Dental Association will convene at Worcester, Mass., Oct. 15-17, 1902. This meeting promises to be better than its predecessors in essays, clinics and exhibits. A cordial invitation is extended to New England dentists, members of their respective state dental societies, to attend and join the association. A rate of one and one-third fare on the certificate plan has been given by all railroads.

EDGAR O. KINSMAN, Secretary, Cambridge, Mass.

MASSACHUSETTS EXAMINING BOARD.

A meeting of the Massachusetts Board of Registration in Dentistry, for the examination of candidates, will be held in Boston, Mass., Oct. 22, 23 and 24, 1902.

Candidates who have applied for examination will report to the secretary, Wednesday, October 22, at 9:30 a. m., at Tufts College Dental Infirmary, corner Huntington and Rogers avenues, and come prepared with rubber-dam, gold and instruments, to demonstrate their skill in operative dentistry. Anyone who wishes may bring his patient. So far as possible patients will be furnished. The Board in every instance selects the cavity to be filled. Partially prepared cavities never accepted.

The theoretic examination—written—will include operative dentistry, prosthetic dentistry, crown and bridge work, orthodontia, anatomy, histology, surgery, pathology, materia medica, therapeutics, physiology, bacteriology, anesthesia, chemistry and metallurgy, and will be held at Civil Service Rooms, State House, from Thursday, October 23, at 9:30 a. m., until Friday p. m., October 24.

All applications, together with the fee of twenty dollars, must be filed with the secretary of the Board on or before October 15, as no application for this meeting will be received after that date.

Every candidate for examination must be twenty-one years of age.

Application blanks may be obtained from the secretary.

Candidates who have taken an examination, and failed, and desire to come before the Board again at this meeting are not required to fill out a second application blank, but must notify the secretary as above in order to be examined. The fee for third and subsequent examinations is \$5.

G. E. MITCHELL, D. D. S., Secretary, Haverhill, Mass.

GETTING A FIT.



Bachelor Uncle (a dentist)—“By Jove! it’s a lucky thing I caught sight of the new baby before I presented the silver mug—I’ll just cut back to the shop, and—



Get him one the right size.”

News Summary.

E. N. CLARK, 85 years old, a dentist at Beloit, Wis., died Sept. 8, 1902.

J. A. HARRIS, 69 years old, a dentist at Pontiac, Mich., died Aug. 16, 1902.

THE PROCRASTINATION of the baby’s teeth is the thief of the father’s slumbers.

O. A. HOLT, a young dentist at Tower Hill, Ill., committed suicide Sept. 10, 1902.

WILLIAM ROSE, a young dentist at Leadville, Colo., died Sept. 2, 1902, from pneumonia.

NITRIC ACID FOR THE VOICE—Dr. Bartholow (*Northwestern Lancet*) says that failure of the voice from fatigue or simple mucous laryngitis is often

wonderfully relieved by a small dose of nitric acid every two hours, well diluted.

E. W. WHITE, a young dentist of Park City, Utah, died September 12 from typhoid fever.

W. W. LORING, 59 years of age, a dentist at Indianola, Ia., died suddenly Aug. 27, 1902.

H. J. BUCHER, 35 years old, a dentist at Milwaukee, committed suicide Sept. 7, 1902.

J. C. BUCHANAN, 79 years old, a dentist at Grand Rapids, Mich., died Sept. 4, 1902.

C. B. CAMPBELL, 25 years old, a dentist of Chicago, died of consumption Aug. 25, 1902.

OLIVER JOHNSON, a young dentist at Lincoln, Neb., died August 21 from typhoid fever.

DEWITT C. BENBOW, 72 years old, a retired dentist at Greensboro, N. C., died Sept. 2, 1902.

D. F. COTTERMAN, 42 years of age, a dentist of Streator, Ill., died Sept. 6, 1902, from diabetes.

A. T. COLE, 23 years of age, a dentist at Marion, Ind., died from tuberculosis Aug. 18, 1902.

A. F. COX, 68 years of age, a retired dentist at Alexandria, Va., died from cancer Sept. 16, 1902.

DENTER.—A patient remarks that a dentist is so called because he puts a dent in one's pocketbook.

APPROPRIATE.—We recently received a letter from a dentist named Pullar residing in New York State.

S. M. GANT, a dentist, formerly in practice at Indianapolis, but latterly in Chicago, died Sept. 5, 1902.

W. C. CARNEY, 32 years old, a dentist at Moundsville, Tenn., died suddenly from appendicitis Sept. 4, 1902.

C. WARNER, 26 years of age, a dentist at Alturas, Cal., was killed Sept. 4, 1902, by falling down a mine shaft.

G. W. NORTH, a dentist formerly at Goshen, Ind., but later of Alexandria, became violently insane Aug. 24, 1902.

LOCATIONS.—According to newspaper report, Higbee, Mo., Seneca, Mo., and Edmore, N. Dak., are without a dentist.

DAVID GIBBONS, one of the oldest dentists in Warren, O., was struck by a train August 20, and probably fatally injured.

E. E. HUNTER, 32 years of age, a dentist at San Antonio, Tex., died Sept. 3, 1902, after a long illness brought on by the grip.

WATER COMBUSTIBLE.—Dr. Lietz of Hamburg claims to have discovered a method of rendering water as combustible as oil, producing a pure white light and intense heat. It has always been a mystery that water, composed

of hydrogen, the most inflammable of gases, and of oxygen, the principal supporter of combustion, should itself be non-inflammable.—*Alk. Clinic.*

C. STODDARD SMITH, 68 years of age, died at Argyle, Minn., Aug. 30, 1902. He was formerly a well-known dentist of Chicago.

DISILLUSIONIZED.—“The saying is, ‘No man is a hero to his valet,’ but the dentist thinks it ought to be, ‘No man is a hero to his dentist.’”

LORENZO BUSH, 84 years old, a dentist at La Grange, Ill., died Sept. 10, 1902. He is said to have named the town of Hinsdale, one of the suburbs of Chicago.

ACCIDENT.—A dentist at Athens, Ga., was badly burned September 13 with sulphuric acid, which was accidentally spilled on him while at work in his laboratory.

THREE KINDS.—A correspondent of the Academy (London) considers that memoirs are of three kinds—biographies, autobiographies and ought-not-to-be-ographies.

W. D. CRANE, 60 years old, a well-known dentist of Newark, N. J., was thrown from a trolley car September 3, and removed to the hospital in a dying condition.

BANKRUPT.—Ira D. Steele, Chicago.—A. N. Hagan, South Omaha, Neb., liabilities, \$24,887; assets, \$8,195. G. W. Shackleford, Savannah, Ga., liabilities, \$1,916; assets, unknown.

HOMEOPATHY PREFERRED.—First little girl: “The doctor brought us twins yesterday.” Second little girl: “That’s where you made a mistake. You should have had a homeopath.”

EPITHELIOMA OF LIP.—A recurrent growth disappeared entirely under galvanofaradism, and a lotion of guaiacol and thiosinamin each one part, glycerin and water eight parts each.—*Armstrong.*

DIVORCES.—Mrs. B. W. Dutton has brought suit for divorce against her husband, a dentist of Chicago.—W. F. Benner, a dentist at Columbus, O., and his wife have each brought suit for divorce.

BAD BREATH.—To remove offensive odors, such as are due to whisky and tobacco, E. J. Kempf (*Indiana Med. Jour.*) asserts there is nothing more effective than 1 part of dioxogen in 5 parts of rosewater.

BAD DEBTS BOUGHT.—A company has been incorporated in Kentucky for the purpose of purchasing deadbeat accounts from dentists and physicians, with the expectation, of course, of collecting same. We wish it luck.

FURTHER DATA WANTED.—Archbishop Ryan was recently accosted by a young man on the street who said, “Your face is familiar. Where in hell have I seen you?” “I really don’t know. What part of hell do you come from?” replied the prelate.

ILLEGAL PRACTITIONERS.—A woman at Danbury, Conn., was arrested on August 16, and fined \$25 and costs for illegal practice of dentistry. She paid up and left the state.—A man at Waterbury, Conn., was arrested on September 6 for violating the dental law.—A young man at Indianapolis,

Ind., was arrested August 27 for practicing dentistry without a license. He was a student in a dental college and had opened the office during his vacation.

EXAMINING BOARD AFFAIRS.—C. B. Bratt of Allegheny and G. W. Klump of Williamsport on September 5 were appointed members of the Pennsylvania State Board of Dental Examiners. Dr. Bratt succeeds Dr. J. A. Libbey.

X-RAY LOCATES TEETH.—A man in Norfolk, Conn., recently swallowed his set of false teeth, and the physicians were unable to locate them, but they were finally discovered with the X-ray near the lungs. An operation is probable.

GERMAN PHYSICIANS RECOMMEND CREMATION.—Several thousand German physicians have signed a petition to the Reichstag, asking that the burning of bodies of persons dying of contagious diseases should be made obligatory.—*Medical Age.*

FEVER BLISTER.—When a pretty girl comes in and wants you to stop an approaching fever blister on her lip "quick before the party," paint it with a solution of flexible collodion and salicylic acid, grs. 12 to the ounce.—*O. L. Peak in Alk. Clinic.*

FIRES.—M. A. Banks, Rockford, Ill., September 8, small fire caused by an electric wire.—E. C. Crawford, Chicago, August 28, loss \$500.—Z. B. Houghton, Paulding, O., September 4, loss \$300.—A. D. Raffington, Bison, Kan., September 3, loss \$200.

RATHER TARDY.—A woman in Chicago recently sued a dentist to recover \$20 which she paid him four years before for a set of false teeth, and which she had just discovered did not fit. The judge dismissed the case and assessed her with the costs.

PROFANITY.—"Who is that scientific gent in Room 15?" asked the scrub-lady. "I dunno," answered the broomgentleman. "But he's a funny one to swear. You ought to hear him. When he saw a lot of mold on top of his ink he said 'b'cillus!' just that way."

ONE AT A TIME.—Mrs. Emdee—"You said to-day that you had cured that man you were doctoring for asthma. Here the evening paper says he died of consumption." Dr. Emdee—"Yes, er—er—my dear, I wasn't doctoring him for consumption; just asthma."—*Judge.*

CALIFORNIA DENTAL LAW ATTACKED.—Two dentists in San Francisco were recently fined \$50 each for violating the dental law of the State. They appealed from the decision to the Superior Court, which, however, has affirmed it, and the matter will now be taken to the Supreme Court of the State, as the purpose is to test the constitutionality of the dental act of 1885.

OIL OF TURPENTINE IN NOSE-BLEED.—Isatchick (*Vojenno Meditsinsky Journal*) saw a case of uncontrollable nose-bleed in a malarial patient, the hemorrhage occurring on an afebrile morning. Tamponing, ergot internally, etc., were of no avail, until, in the evening, tampons soaked in turpentine were introduced, whereupon the bleeding stopped. Two days later the bleeding recommenced, and tampons of turpentine and cotton were again introduced,

with the effect of arresting the hemorrhage. A third attack of nose-bleed was arrested in the same manner after a few days. Billroth recommended oil of turpentine in hemostasis.

HEART LONG-LIVED.—Though she was dead for eight and one-half hours, the heart of a patient in a Chicago hospital remained active and pulsated with regularity, although the woman was proven dead by all other tests. The case was pronounced one of Landry's paralysis.

DAMAGE SUITS.—A woman in Detroit is suing a dentist for extracting the wrong tooth.—A man in Grand Rapids is suing a dental parlor for \$2,000 damages, claiming that during the extraction of a tooth his jaw was fractured, and that blood-poisoning later set in.

RECEDING GUMS.—The application of glycerite of tannin to spongy and receding gums will be found effective. Whether this condition be due to ptialism or debility following acute disease, the topical use of this simple remedy will be satisfactory.—*Med. Standard.*

TO BEND A CROWN-POST WITHOUT STRAIN ON THE CROWN.—Grasp the post with a pair of crown-contouring pliers. The convex jaw of the pliers forces a portion of the post into the concave jaw, and thus bends it without danger to the porcelain crown.—*Pacific Med. Jour.*

SOUTHWESTERN MICHIGAN DENTAL ASSOCIATION met at Three Rivers, Sept. 9-10, 1902, and elected the following officers: President, C. H. Worboys; vice-president, A. L. Le Gro; secretary-treasurer, C. W. Johnson. The next meeting will be held in April, 1903, at Albion.

SOUTHWEST VIRGINIA DENTAL SOCIETY was organized Sept. 5, 1902, at Roanoke, Va., and the following officers were elected: President, C. H. Carson; vice-president, J. H. Hartman; secretary-treasurer, R. L. Simpson; executive committee, W. P. Nye, J. H. Campbell, W. S. Gregory.

NORTHERN IOWA DENTAL SOCIETY held its eighth annual meeting Sept. 2-4, 1902, and elected the following officers: President, Wm. Finn; vice-president, A. W. Beach; secretary, C. L. Topliff; treasurer, H. W. Riser. The next meeting will be held at Clear Lake the first week in September, 1903.

MORE THAN HE COULD STAND.—"After you have taken this medicine," said the physician, "give yourself a hot-water bath and go to bed at once." "Gosh, doc!" exclaimed the shaggy-haired patient. "Can't you make it a mustard plaster or somethin' like that? I always kitch cold when I take a bath!"

INSURANCE FOR TEETH.—The latest freak insurance has developed in England, the home of novel forms of insurance. This scheme is tooth insurance, and the company agrees for a premium of \$15 per year to keep the teeth in order. It is reported that the company expects to do business in the United States on the same basis.

NATIONAL DEATH-RATE.—The fifteen principal causes of death, with the rate per 100,000, as made public by the Census Bureau, are as follows: Pneumonia, 191.9; consumption, 191.5; heart disease, 134; kidney disease, 88.7; diarrheal diseases, 85.1; apoplexy, 66.6; cancer, 60; old age, 54; bronchitis, 48.3; cholera infantum, 47.8; debility, 45.5; inflammation of the brain and

meningitis, 41.8; diphtheria, 34.4; typhoid, 33.8, and premature birth, 33.7. Death from all the principal diseases shows a decrease since 1890, the most notable being in consumption, which decreased 54.9 per 100,000.—*Dietetic and Hygienic Gazette*.

POWER OF THE EYE.—A man recently went to a dentist to have a tooth extracted, and gas was administered. The man seemed to be under its influence, but he kept one eye open. More gas was given, but to no effect. "Shut that eye," said the doctor finally, losing patience. "Can't," said the man in a drowsy voice, "it's glass."

GERMANY FROWNS ON ADVERTISING.—A Berlin dentist recently advertised that the work he did was absolutely painless and free from danger. On complaint of the local dental association he was summoned to court and warned that any repetition of the advertisement would mean a fine. He was also assessed the cost of proceedings.

NOISY.—Here is a sample of a good college yell:

"Well man, sick man, dead man—stiff.
Dig 'em up, cut 'em up—what's the diff.
Humerus, tumorous, blood and gore!
Syracuse medicos, 1904!"

ENCOURAGING.—"I haven't had a single call since I opened my office ten days ago," complained the newly fledged M. D. "Here I sit day after day like Patience on a monument." "Oh, well, don't get discouraged," rejoined the sympathetic friend. "It's only a matter of time until you have patients under monuments."—*Chicago Daily News*.

ANESTHESIA AND ALCOHOLICS.—In operation upon alcoholic subjects it is often wise to give them a drink of spirits an hour or less before its performance. These people are more restless than others and often require a greater quantity of the anesthetic to abolish sensibility, but long deprivation of drink, if anything, only tends to intensify those unfavorable tendencies—*Inter. Jour. of Surg.*

EPISTAXIS.—A young lady, 17 years old, five feet high, weight 125 pounds, blonde, had been bleeding at the nose profusely for half an hour, saturating several large towels and quite a quantity caught in the bowl. I at once injected atropin sulphate gr. 1-100 hypodermically, and introduced into the nostrils a pledget of cotton with ten drops of oil of erigeron on it. In five minutes all hemorrhage had ceased and did not recur. This oil is a wonderful styptic. I have used it for many years, especially in post-partum hemorrhages.—*J. W. Martin in Alk. Clinic*.

VARIATION OF THE QUANTITY OF THIOCYANATE CONTAINED IN HUMAN SALIVA, AND ITS CAUSES IN HEALTH AND DISEASE.—Jul. A. Grober (*Chem. Centr.*, 1901; *J. Chem. Soc.*, 80.) Potassium thiocyanate is found in the human body only in the saliva. (This statement is not true, as it exists in both the blood and the urine.—*J. A. M.*) It is not formed by the decomposition of the saliva, but is actually secreted, and the quantity diminishes with the duration of the secretion. The quantity present in the saliva is not affected by change of diet in the case of healthy persons or by the use of tobacco by

non-smokers. The secretion of the thiocyanate is probably dependent on the condition of the organism in respect to the albumen decomposed and utilized, and where this is small in amount, as in severe cachectic cases, little or no thiocyanate is secreted.

MARRIED.—A. H. Frith, Bermuda.—Susie A. Kingsbury, New Hartford, N. Y., Sept. 3, 1902. H. G. Johnson, Rockford, Ill.—Cora Ransom, Chicago, Oct. 4, 1902. R. C. McCowan, Zanesville, O.—Elsie Waller, Zanesville, O., Sept. 9, 1902. J. J. Reed, Beloit, Wis.—Alice J. Kimball, Rockford, Ill., Sept. 10, 1902. H. D. Whitmarsh, Binghamton, N. Y.—Mabel Fuller, Tully, N. Y., Aug. 20, 1902.

SAME OLD GAME.—Reports from the West indicate that the people out there are just as easy as they are elsewhere. The fakir's game is to extract teeth without cost, providing an order is given for a new set. A few days later he tries in an old plate, which he always carries in stock, collects half the price for the set, and takes it away with him to be altered. That is the last the victim sees of teeth, money or fakir. The public certainly does need "dental education."

DISTINGUISHING DEATH FROM CATALEPSY.—A means of distinguishing death from catalepsy has been devised by Dr. Icard of Marseilles and submitted to the Academy of Sciences. He injects fluorescin, a strong coloring matter that is not poisonous, into the veins. A gram of the fluorescin solution will color 45,000 liters of water. If there is any circulation the body will turn grass green in two minutes, but the color passes away in a couple of hours without doing any harm.

SINGULAR COINCIDENCE.—In looking over the last issue of the *DENTAL REVIEW* we notice the president's address, delivered before the Indiana State Dental Association, in June of this year, by Dr. C. E. Pittman. The address is two pages long, and one page of it is identical in wording with the president's address delivered before the Illinois State Dental Society, by Dr. J. G. Reid, in May, 1901, and printed in the *DIGEST* for July, 1901. Great minds move in the same channel.

ELECTRIC LIGHT ON THE EYES.—A Russian specialist has decided that, contrary to the general opinion, electric light plays less havoc with the eyes than other forms of artificial light. He bases his deductions on the fact that disease and damage to the eye are proportioned to the frequency of the closure of the lids. He finds that the lids close in a minute 6.8 times with candlelight, 2.8 times with gaslight, 2.2 times with sunlight, and 1.8 times with electric light.—*Med. Record.*

SNORING.—Snoring, says W. Frendersthal (*Med. Record*), is due to the fact that in so-called mouth-breathers the free edge of the soft palate hangs loose in the pharynx and vibrates with every inspiration and expiration. This may be due to some obstruction to the upper air passages by adenoids or tumors, or to relaxation of the soft palate, so that it falls backward when the patient lies down, especially upon the back, thus closing up the passages between the throat and nose. In this latter class of cases the author has had some encouraging results by applying the galvanic or faradic current di-

rectly to the velum palati. He warns against using mechanical devices to keep the mouth closed during sleep. If a person snores there is a pathological reason for this which should be ascertained.

WHAT THE BRAIN WILL STAND.—A French investigator has come to the conclusion that the brains of naval and military men give out most quickly. He states that, out of every 100,000 men of the army or naval profession, 199 are hopelessly lunatics. Of the so-called liberal professions, artists are the first to succumb to the brain-strain, next the lawyers, followed at some distance by doctors, clergy, literary men, and civil servants. Striking an average of this group, 177 go mad to each 100,000.

A WONDERFUL CIGARET.—The following notice appears upon the wrapper of a cigaret manufactured in Cuba: "The proprietors of this FACTORY guarantee that the CIGARETTES which they manufacture are hygienical and have obtained great credit for the curative influence which they exercise; for by their use *constipation of the lungs* and the bronchial apparatus is avoided; contagious atmospheres desinfected; bad breath sweetened; the teeth preserved and scorfula prevented."

RUSSIAN SURGEONS.—When he is first engaged a Russian surgeon starts upon the salary of \$400 a year. On this pay he remains four years, when he is advanced to \$500 yearly for four years. Four years later this is increased to \$650; then to \$750, the final remuneration, the highest which he can obtain, being \$2,750 a year. When compared with the salaries of American army surgeons, it will be noted that Russia pays less than half the amount received by United States military surgeons.

CARBOLIC ACID AS APPETIZER.—It is reported, says the *Phila. Med. Jour.*, that an Austrian physician, by applying carbolic acid gas at a temperature between 100° and 120° F. below freezing, has found a means for giving sick people an appetite. The cold carbolic acid, wrapped in a bag of brown holland, is placed upon the epigastrium a half hour before meals. A layer of cotton-wool is inserted between the bag and the stomach. It is said that after five days' treatment a good appetite returns.

EXASPERATING.—Oh, dear! How perfectly exasperating these things are, to be sure. Here's a faith-curist at Urbana, O., who attempted to resolve four attacks of small-pox into nothingness, by the power of her mind and alleged spiritual partnership. But in this case "the horse blew first;" and instead of curing her patients she contracted the malady herself, and had to send for a real doctor, a crude and crass materialist, who prescribed real material drugs, which she took obediently and got well.—*Alkaloidal Clinic.*

HARE-LIP.—Ratchford reports a rather strange history of a family in which there were born four girls with hare-lips and cleft palates and three boys without any trace of this peculiarity. A curious fact was that the mother during pregnancy was able to foretell the sex of the children and whether or not they would be thus deformed, at least that was her belief, and it seems to have been borne out by the facts. Whether her mental condition of depression under this conviction had anything to do with it, of course, is worthy of thought. There was a bad family history of tuber-

culosis on both sides, but no history of hare-lip. The mother had a high arched palate.—*Archives of Pediatrics.*

SUBLATA CAUSA TOLLITUR EFFECTUS.—The *New York Times* is responsible for the following: At one of Dr. Mitchell's surgical clinics a woman was presented who had a dislocation of one side of the lower jaw. The history showed that the injury had been sustained while she was strapping a very tightly packed dress-suit case. After reciting this history, Dr. Mitchell asked a student: "What method of procedure would you advise to bring about a reduction of the dislocation?" The answer came promptly: "I would advise her to unstrap the suit case, sir."

GROWING TOGETHER OF THE JAWS.—Castro reports the case of a man 23 years of age whose jaws had grown inextricably together as the result of noma after measles in childhood. He was able to eat only liquid food, and this through a small opening where two cuspid teeth were missing. General and even local anesthesia were impossible under these conditions, and the cheeks were first detached from the jaws. When this wound had healed the interlaced teeth were pulled and the jaws pried apart, until comparative function was restored on the left side.—*El Siglo Med. Jour. A. M. A.*

CONGENITAL PERITHELIAL TUMOR.—H. Füh (*Beitrage z. Geb. u. Gyno.*) claims that the tumor he describes is the only known example of its kind. It was in the gum of a girl baby two days old, and although it did not start in the enamel germ it had involved the latter in its growth. It was as large as a hen's egg and protruded from the mouth at birth. After its removal the teeth developed normally except the two upper incisors, which are rudimentary and gray in color. The child is now a healthy two-year-old. Six cases are on record of perithelial tumors of the ovary, of which three were malignant.—*Jour. A. M. A.*

FRONTAL SINUSITIS WITH MEASLES.—A case of this rare complication of measles was recently reported by Dr. Joseph Belin in a man of 18, with recovery following incision. Suppuration of the frontal sinus lasted about ten days, ceasing after the evacuation of the abscess through an incision in the eyebrow. A few such cases have been reported in influenza and scarlet fever. He reported another case, in a man of 24, in whom frontal and ethmoidal suppuration, with influenza, was followed by brain abscess. The autopsy revealed an abscess of the frontal lobe, which was probably secondary to the frontal and ethmoidal sinusitis.

ROBBERIES.—Aug. 17, 1902, several dental offices in Waterbury, Conn., were entered by thieves and several hundred dollars' worth of gold and material was taken.—Sept. 19, \$300 worth of stuff was taken from the offices of four dentists in a building on the West Side of Chicago.—September 7, \$100 worth of material was taken from the offices of two dentists at Springfield, Ill.—August 20, a daring robbery was committed in Lowell, Mass., by a sneak thief, who took a watch out of a coat in a dentist's reception room while the dentist and the owner of the watch were in the next room with the door open.—August 24, the office of a dentist at Fergus Falls, Minn., was robbed of \$60 worth of gold.—September 7, a dentist at Fremont, Neb., lost \$75

through burglary.—September 4, \$200 worth of booty was taken from the offices of three dentists at Batavia, N. Y.—September 12, a considerable amount of gold and other material was taken from the office of a dentist at Marysville, O.—September 16, a dentist at Cleveland found himself \$25 poorer through the visit of a light-fingered individual.—September 4, considerable stuff was taken from the office of a dentist at Piqua, O.—September 2, a thief in Dayton, O., made a considerable haul from a dentist's office.—August 21, a dentist in Philadelphia lost a considerable amount of gold and other material.

CLEFT PALATE.—A. Vander Veer (*Reference Hand-Book of Medical Science*) ascribes the cause of this deformity to heredity and the want of a meat diet and of sufficient phosphates on the part of the mother. In confirmation of this view, he cites the fact that several years ago the lions in the Zoölogical Gardens of London were fed upon flesh containing too large bones for them to break and swallow. The young-born while this method of feeding was pursued had cleft palates and lived but a short time. The lions were then fed upon small animals, whose bones they could break easily, and the young born afterward had perfectly formed palates.

COCAIN-EATING IN BENGAL.—The habit of cocain eating seems to have spread extensively, says the *Lancet*, among the natives of Bengal. It is sold in small paper packets, containing one-half or one grain, which are obtained for one-half or one anna, respectively. It is impossible to say how much is consumed by any one individual, but several grains a day have been confessed to. The sense of feeling well is followed by depression, but the habit appears to be peculiarly seductive, and once commenced is with the greatest difficulty abandoned. A blackening of the teeth is said to be caused by cocain-eating, and the blackening is thought to be characteristic.

FELON.—Seneca D. Powell (post-graduate) suggests the following method of treatment for felons: Take a hypodermic syringe and find the sensitive point, or take a lead-pencil and press the point down over the felon until you thus localize the sensitive point. Go down to the periosteum with the hypodermic and inject cocain at this point, and keep injecting it as you draw out the syringe. Then cut down to the periosteum with a bistoury, and with a syringe or probe go down into the pocket and inject carbolic acid. You have then taken the necessary steps to kill the microbe. If you are afraid of carbolic poisoning, put in some alcohol. Put on a loose dressing.

NOT LIABLE TO OCCUPATION TAX BY HAVING TWO OFFICES.—The Court of Criminal Appeals of Texas has, in *Broiles vs. State*, reversed the judgment of the County Court, wherein the party named was convicted, under subdivision 13 of the occupation tax act of 1897, for practicing medicine as a specialist, traveling from place to place, and his punishment assessed at a fine of \$75, being the amount of state and county taxes. It says that the proof showed that he was located and had his residence at one place, and also kept an office in another town, where this offense was alleged to have been committed. But he was not, it holds, a traveling physician or specialist going from place to place in the practice of his profession, within the meaning of the occupation

tax act, and that a new trial should have been granted because the evidence failed to support the verdict.—*Jour. A. M. A.*

GROWTH OF THE HAIR.—Dr. Jolly (*La Presse Med.*) recalls his former work on the chemical composition of horse-hair. Functional activity attains its maximum in the black hairs, which contain infinitely more phosphate of iron than red or blonde hairs. Falling of the hair is often observed in nursing animals; similarly, nursing women lose a great deal of hair. This is apparently caused by the fact that the phosphates are not fixed in the hairs, but are carried away by the milk secretion. Loss of hair in arthritic persons is quite different. An arthritic patient is one whose cellular nutritive functions are modified by his disease, and in whom the hairs effect the permanent fixation of the phosphates in themselves in a very imperfect manner.

FATALITIES.—A young woman at Camden, N. J., is dying from lockjaw following the extraction of a second molar.—A girl in Chicago recently tried to relieve toothache by putting a quantity of carbolic acid in the cavity. She accidentally swallowed considerable of the acid, and for a time her life was despaired of, but she will recover.—A man at Salina, Kan., took gas for the extraction of a tooth, and for several hours afterwards was so dizzy that he could not walk.—A young woman at Blairsburg, Ia., almost bled to death last month from the extraction of a tooth, but is slowly recovering.—A woman at Wilkesbarre, Pa., recently had several teeth filled and crowned. A few days later her teeth began to ache, her gums became inflamed, her limbs swelled, and she had a peculiar metallic taste in her mouth. The physicians in the hospital to which she was taken diagnosed her case as one of metallic poisoning, and discovered that the crowns were made of brass and not gold. The woman died a few days later and the coroner is investigating.—A fourteen-year-old boy at Rose Point, Pa., died July 28 in a dentist's chair while having some teeth extracted. A physician administered the anesthetic.—July 14 a woman at Massillon, O., died under the influence of chloroform given prior to tooth extraction.—September 12, a woman at Taylorville, Ill., died under the influence of chloroform while having a tooth extracted.—August 24, a man at Sandusky, O., had a tooth extracted and almost died from hemorrhage.—August 28, a boy at Denver, Colo., had a tooth extracted and it was a week before the flow of blood could be stopped. He came from a family of "bleeders."—August 29, a three-year-old child at Newport, Pa., died from blood-poisoning, resulting from the extraction of a tooth.—September 11, a woman at Niles, O., died under chloroform given for tooth extraction.—August 28, a boy at Toledo, O., had some teeth extracted by a street fakir and lockjaw set in. His recovery, however, is expected.—September 11, a woman in Chicago died under gas given prior to tooth extraction.—Aug. 31, a young woman in Brooklyn had a tooth extracted, and the hemorrhage was so great that for some time her life was despaired of.—Sept. 1, a woman in Chicago died under chloroform given prior to tooth extraction.—September 11, a young woman at New Orleans died under chloroform. Three administrations were made, as she had several teeth to be taken out.

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Original Contributions.

PROFESSIONAL ETHICS VERSUS PATENTS.

BY C. E. BENTLEY, D.D.S., CHICAGO. READ BEFORE THE ILLINOIS
STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

It is quite the customary thing nowadays to inveigh against commercialism—that desire for gain which they say is threatening to deluge the world and to sweep aside all things that cannot be quoted in terms of dollars and cents. Greed of gain is a modern fever, we are told, from which no part of the body politic is immune. To my mind, this is glaringly untrue. These selfish human qualities are as old as man, and even if in this twentieth century unbounded opportunity and almost unrestricted resources, natural and artificial, do give them a larger place and more prominent setting in the drama of life, the powers which hold them in check, brotherhood and altruism and cooperation, have grown in like proportion and the equilibrium has been preserved. In fact, I must go further and assert that in no stage of history has there been a deeper and a wider sense of a common tie—a deep underlying sense of brotherhood, which is so inimical to personal selfishness, and which subserves the use of each for the good of all—than at present. Exclusiveness can have no place where liberality and humaneness make for breadth and depth and nobility in life, on whatever line of activity. Exclusion—the cutting off of my brother from things that are mine—leaves me within a selfish enclosure where there is stagnation and decay. Inclusiveness, sharing, brotherly exchange of mine and thine, means growth, movement, vitality and all the powers which make for progress.

Of all the places where exclusiveness seems most inappropriate, none is more so than what is known as a liberal profession. The name itself indicates that to which exclusiveness is most deadly, and

stands for all that makes for unselfish devotion and high use for the service of humanity. Dentistry, from being a mere handicraft, has by years of hard and noble labor by its devotees been lifted to a proud place among the useful arts and liberal professions. Progress connotes obligation. In using and spreading and developing as the profession has done, it has incurred the obligations of its elevated position—Noblesse oblige—and from the heights to which we have climbed we cannot afford to close our minds and senses to the highest impulses of our times. Sharing, helping, giving as well as receiving, must be our mutual spirit if we would keep abreast of the highest and the best; and if there be any habits or customs of a contrary nature which have come to us out of an old order of things, we must put them aside, *stamp them out*, before we can reasonably place ourselves in the front ranks of those modern things which are of the highest morality.

From this point of view, then, is it justifiable in a dentist to restrict in any measure the use of an invention whose purpose is to relieve suffering and to facilitate the labors of fellow-workers? Such action, to my mind, is inimical to the ethics of our profession. It not only repudiates the debt which all men owe to the progress and advancement of their own special era, but it evades that more direct personal obligation which every man should acknowledge to the profession which has done so much for him—which has supplied him with the ability to make the very thing whose free use he denies to her when he places it under the greedy hands of a patent.

The college curriculum itself, the medium by which the embryo is made into an actual dentist, is but the accumulation of knowledge, of systems, of methods and of ideas, to which thinking, studious, inventive minds have contributed through all the years. This vast treasure house is open to the newcomer without let or hindrance. He freely helps himself; uses what he takes for his convenience and profit; then as soon as he sees a method or an idea which will still further increase this treasure, and whereby he may be able to do for others what has so freely been done for him, forthwith he keeps it to himself and proceeds to build an enclosure around his creation, exacting toll from all who desire to share its benefits.

Emerson says, in his essay on Compensation, "Benefit is the end of nature. But for every benefit you receive a tax is levied. He is great who confers the most benefit. He is base—and that is the one base thing in the universe—who receives favors and renders

none." A man who thoroughly digests and assimilates this truth from one of the world's wise men will be only too glad to give his very best, in order that he may escape the baseness of only receiving.

It seems strange to me that although as a profession we have made such marvelous progress within the last decade, we still make no advance in this matter of patents, standing with hesitating feet because of divided opinion. The history of other professions would seem to be a sufficient guide to decision, even if purely ethical ideas have little weight with some. No other liberal profession harbors this selfish practice to any appreciable extent. In the world of arts and crafts and pure mechanics patents have their place and need no argument to defend their *raison d'être*, but the very nature of a liberal profession prohibits a dental doctor—and doctor in its purest meaning is teacher—from this method of exclusion. To my mind, every man who patents tacitly puts his calling among the crafts or trades and forfeits his place in the ranks of professional men. I fully agree with one of the brightest minds in our profession (Dr. Rollins) when he says, "So long as members of the profession who patent their inventions and make money on them are honored to the extent of our power by being asked to be leaders in our schools and before societies, so long will dentistry remain a trade, and I for one shall be ashamed to use my dental degree." The medical profession has long outgrown this practice. The man who patents his drugs, his methods or his instruments is soon relegated to the realm outside the ethical ranks, and in some countries the physician who resorts to such money-making process forfeits his diploma.

Albert Shaw, editor of *Review of Reviews*, at the recent convocation of the University of Chicago, paid a tribute to the medical profession which is worthy of a verbatim report here. He said: "It is to men of this noble profession that we owe that greatest of all modern discoveries, namely, the discovery that those very conditions of life which fifty or seventy-five years ago seemed destined to destroy the human race in the civilized countries of high industrial activity, could be turned into conditions for the positive improvement and progress of the race. It was this profession that developed the modern science of sanitary administration; worked out and applied the germ theory of disease; abolished epidemics of the large and uncontrolled sort, such as used to ravage all great towns at frequent intervals; showed us the relation of pure water,

sufficient air supply and sunlight to the health of the community; taught us to inspect food; lowered the rate of infant mortality by guarding the milk supply, and, in short, set the real standard for the administration of municipal government." If patents had shackled its every step, how far along this noble list of achievements would medicine have traveled to-day?

We claim to be a branch of that noble profession of medicine, and during the last quarter of a century we have fully demonstrated the justice of that claim. Verily, in several instances the younger branch has led the older in some directions never before exploited. We cannot, then, afford to pursue practices which experience and lofty development have shown the older branch to be wrong and retrogressive. If we rescue the husks which our senior brothers have outgrown and cast aside from the dust heaps of primitive customs, and deck ourselves with their shameful covering, can we reasonably expect to stand side by side with that other and claim the same respect and recognition from just and sensible people? Again, one who enters as a newcomer into a household already established and organized must accept the rules and regulations which he finds there. He cannot expect to impose his ideas in the place of those already well founded by time and experience. If he come within he must conform, and if he cannot conform *he must stay outside*. But dentistry is *within* the household, and the time is near at hand when those dentists, just as those physicians who patent, will be considered apart from the brotherhood of bona fide scientists.

"But I am entirely within my legal rights when I patent my invention," says one. Granted—granted instantly, but, my friends, this is not a question of law, but of *professional ethics*. The law takes no note of the ethical quality of action, and it is the ethical quality of our acts which raises us above the ranks of craftsmen and places us with other liberal professions. The question of dental patents is a purely moral one and can be approached in no other light. The man to whom this appeal means nothing, who is unable to see other than the dollar mark on things, of course will continue to patent; but the point is that the established code of our great calling is such that in doing so he will immediately read himself out of the legitimate ranks of the profession.

Looking at the matter from a commercial point of view, even the upholders of patenting fail to prove that there is ever any commensurate gain to the patentee. On the contrary, the several cases

of litigation, the squabbles and the unseemly quarrels that have blotched professional history, have, as a rule, sprung from patenting. The mistake of Morton's life was the patenting of the discovery of ether. As a free gift to humanity its source would never have been challenged; but so soon as the process of exclusion began, the right to priority of conception was immediately challenged, the war was on, and he did not reap the reward he would have done.

How different the case of vaccination and the Roentgen rays! Given freely to the world, man, relieved of the peculiar ills to which these ideas have been applied, rises from his sufferings and calls their creators blessed.

Suppose Black and Johnson had sold office rights for extension for prevention in cavity preparation! How much good work would have been made impossible in general office practice, and how much human suffering must necessarily have gone unrelieved.

The present case in litigation of the International Tooth Crown Company is the *reductio ad absurdum* of patenting in our profession. It is carrying the reason of the patent advocate to its logical limit—and what an absurd and monstrous limit that is no practicing dentist doubts. The greatest possible transgression of professional ethics is that one of us should bargain with and sell to an outsider, and by so doing enable that outsider to fatten off professional labor—that he should put it within the power of that outsider to embarrass and mulct his fellows to an immeasurable degree. This is what the notorious case of the International Tooth Crown Company seeks to establish. This case has, however, done one good thing for the profession—it has formed the dark background which brings out in brightest colors the high character, unselfish zeal and manly worth of one of our number. It has afforded us the opportunity of seeing put to actual, practical and material test that professional honor which is so dear to us all. Too much can never be said in appreciation of Dr. J. N. Crouse in the battle which he is still fighting against this moneyed corporation. Like a mighty bulwark, strengthened by a high principle, he has placed himself between the profession that he loves and the invading power, nor time, nor discouragements, nor the seductive allurements of material settlement out of court have been able to affect his noble stand. Such a man, as old Horace says, has built himself a monument more lasting than brass, which neither time nor the corroding elements can ever destroy.

I am quite aware of the fact that many among those dentists who are opposed to the principle of patenting instruments and methods see an extenuation in the first case which is lacking in the second. Of course when a man comes into the office and offers for so much to show how to do so and so, any well principled dentist, be he ever so saintly, feels like indulging in a little muscular christianity for the sake of a good cause, and introducing that brazen applicant to a taste of strenuous life which would land him suddenly on the other side of the office door. This glaring case of barter, this undignified peddling, has no possible excuse and needs no further discussion.

But the man who patents an instrument says, "A patent preserves the purity of make of my invention. Without it any cheap or faulty imitation can be made, which in some cases would work great harm to the profession." This at first seems an exceedingly proper contention. It is necessary that a creation which is the outcome of labor, mental and physical, should not be tampered with, and that its integrity should be kept intact, in order that it may best serve the purpose for which it is formed, and, too, in strict justice to the maker. If this integrity can be preserved *only* by a patent, then a patent by all means. But is the patent the sole shield to the inventor in such a case? By no means. Every dentist knows or should know that the publishing of a new instrument in the records of any society in the presence of a third party saves the instrument to the inventor. With such means of protection available, one must reasonably believe that the man who patents does so not for protection, but for profit only.

Then, again, even if we grant that patenting is absolutely necessary to prevent change in make of instruments, whatever benefit is gained thereby is surely more than offset by a possible harm which restriction may work. Patents stop the progressive movement of improvements, and if all inventors had used them the profession would have been deprived of much excellence on its mechanical side, for it is out of the labors of many minds that the best finally appears. Hardly ever does one mind conceive all the possibilities of the thing conceived, but it is out of the added thought and improvement suggested by the experience of one here and one there that final perfection is attained. Patents in their selfishness would stop all this and halt with greedy hand possible progress in the profession.

Furthermore, many patents are taken out not to protect a device

but to prevent its manufacture. This, as you know, is not to protect the profession in any way, but in order that the sale of some device already on the market may not be affected. You can easily call to mind a number of things which you cannot procure, simply because the manufacturer will not put them on the market or allow others to do so. Think of Darwin or Agassiz or Roentgen holding back any discovery or book in order that some previous thing might first be disposed of!

Those who are in favor of patenting always love to make a parallel argument between the copyright and patent. The principles governing these things are not parallel. There are some essential differences that I desire here to note, and in this connection I desire to pay tribute to Prof. E. Townsend, who has written a comprehensive thesis upon this subject which can be found in the *Dental News Letter*, 1853. In substance he says: "Copyright does not forbid translation into another language; it does not forbid bona fide abridgement. It does not—in the nature of things it cannot—forbid any other use or employment of the ideas and language of the book except for tradesmen profit in the republication. Thoughts and words are of necessity free. Once born into being, they may be repeated all around the world, serving all the uses of which they are capable. Copyright of the original books protects them and their author from nothing but the booksellers' piracy. The ablest works of elementary science that are now copyrighted are but new arrangements of principles and doctrines that have been a hundred times in like manner secured to as many authors and compilers of them, and they still lie open to a hundred or a thousand new forms of combination or presentment, with no better chance of being withheld from general use than they had at first. Nothing in authorship is or can be monopolized. No sooner is a new view of a scientific truth uttered than ten thousand minds are busy molding it into as many forms, each capable of all the special use there is in it. In fact, science admits of no monopoly; no law or penalty either can or attempts to restrain the property and use of its truths to the service of its first discoverers. Once ushered into being, they are yours and mine and may be servants unto thousands. Whatever is essential in them is subject to remolding, recombination, reapplication in all the forms that diversity of mind can give. It is not so with levers, springs, wheels and pulleys, and the combination of elements which patent rights protect.

"The points of contrast which are important in my apprehension may be thus briefly stated. A patented machine cannot be translated into other forms, as of oak wood into walnut, iron into copper, or buckskin into goatskin, where the *modus operandi* and the effect are precisely equivalent. This would be an evasion and an infringement; but the most literal translation of a German work into English, or of any language into any other, is allowed by copyright. A machine cannot be abridged in bulk, retaining all the principles, copying the mode of combination and preserving the identical operation thereof. A book may be so reduced and the act is not punished or prohibited. A machine cannot by the addition or subtraction of a lever, pulley, wheel or screw be turned upside down or 'tother end foremost,' and thus be made to produce the same effect precisely, by such merely formal alteration, and escape the penalty of the patent laws; but the entirety of a book may be so employed; every idea in it can be used by an altered utterance and the identical effects be all derived without offense against the statute. Of a machine the essential characteristic is protected against any mere formal modification. Of a book the essence and operative power is the very thing that is not protected. The form, which in all scientific treatises is as nothing in the way of its public and unrestricted use, is the only thing secured by copyright. A bookseller may not reprint a poem, but an author may write it down to prose, and sell it as his own; or an orator may rehearse it with all its power to please, convince and move his audience, and he is blameless before the law. A book with the warning of the Government on its fly-leaf is no terror to the free intelligence of the reader. MIND is not forbidden to appropriate and employ at will, for either pleasure or profit, anything it contains in any manner in which the material may be beneficially used. The substance and spirit of science and literature are thus in happy keeping with their divine nature, born free, and cannot be brought into bondage to any man. The particular form which their first revealer gives them only is his exclusive right, and that form being all that he can claim, every plodding bookright who follows him may have as great a pecuniary benefit of his toil, by a new and useful reproduction of his thoughts, as the parent brain itself can claim or hold. The clear conclusion, therefore, is that copyright is not a conflict of interests between an author and the profession for which he labors, or the public which he serves, but between him and the mechanics who print and bind

the volumes he produces, and the trader who vends them in the market.

"But the patentee of a machine, or novel composition of matter, stands to the world a monopolist of all the value that there is in his particular invention. He sells the right to use it, and the public buys it upon the commonest principles of trade; the community surrender their own equal liberty of discovery to its antecedent advantage in point of time and compromise the conflicting rights by a concession which they deem a fair or at least an effectual one. Such is the difference between the two. If this grand distinction were not somehow felt, we should perhaps see less of the ambition of dental patentees and of their advocates to exalt the mechanical monopoly which they approve to the level of the more unequivocal and unquestionable right of authorship in the creation of their genius and the products of their toil. Thus patent right and copyright are broadly different in all their bearings upon the interests of the profession and upon the relations of the practitioners of dentistry."

Too much praise cannot be given to that class of men in our profession who are constantly giving to us without cost the product of their thought and research. A roll of honor should be formed, and foremost on it should be placed the names of men who have illumined our path and lightened our labors by their free contribution to our calling. Distinction in a liberal profession should not be measured by the size of one's practice, but rather by his contribution to the profession of which he is a member. All honor, then, to those who have given freely to the uplift of our calling without hope of reward. Let us not forget this prince of givers.

I believe that in the past dentists who patented sincerely felt that they were benefiting the profession, and at the same time thought it but fair that they should seek to get some remuneration for the time and money spent in making this device. Many by experience have seen the error of this course. Several years back (1889), at a meeting of the New York Odontological Society, while this subject was under discussion, Dr. S. G. Perry, inventor and patentee of the separator and engine, said: "I have never received a penny for it, except for the transfer of the patents, and, gentlemen, it is the regret of my life that I ever took a penny for it. I would give a great deal to-day if I had never taken the patent for either the engine or the separators. I did not appreciate then as I do to-day

the danger to our profession from this mania of taking patents." Such testimony—and doubtless there are many who are in the same class with Dr. Perry—is valuable as coming, not from the theorizer who has nothing at stake and pleases himself with the utterance of glittering generalities, but from one who out of the fullness of actual experience places himself against the restricting patent on a high plane of ethics which a patentee never can reach.

For, after the last analysis, it is the welfare and future of our profession which all individual interests should observe. "Men may come and men may go," but the profession, like the brook, goes on forever. The individual with his ideas and acts is important just in proportion to the strength and uplift which those ideas and acts give to the upward movement of the group of which he is one. The soul that feels its individual responsibility to the sum total of life can feel no greater happiness than in the thought that the world has been made a little better because it has sojourned here awhile. The professional man with the genuine scientific spirit can have no greater reward than that his profession has pushed an inch forward because he has helped. We work in the present, but it is the future for which we build. "Projected efficiency," let them sneer who will, is the keynote of all existence. This is the principle, whether advanced or not, which has enabled us to fall heirs to so much that is great and good. It must be our greatest pride, then, to pass on to those who come after gifts that have increased in value under our conscientious care. This subject of patents has vexed and retarded our profession long enough; can we not in these first years of a new century with one united effort bravely face and finally settle it? This is my earnest appeal to-day, for I am truly convinced that not until we do this can we really attain the professional heights to which dentistry lays claim.

Discussion. *Dr. C. P. Pruyn*, Chicago: When many of us took up the practice of dentistry we entered the ranks of a trade or an art rather than a profession, but as the years have passed the trade element has been considerably eliminated and a professional spirit has been developed. The question that now presents itself to us is this—are we a profession or are we a trade? If we are a trade and work as tradesmen, the procuring of patents is right and proper, but if we are a profession, if we are doctors in the true sense of the term, if we are teachers as we should be, the obtaining

of patents upon those instruments and appliances that are needed for the amelioration of the ills to which humanity is subject is entirely out of place. We are a fraternity, and the bond of brotherhood is strengthening from year to year. We have a noble inheritance from our fathers, who took the stand that gladly out of the abundance given them they would distribute unto others, and if it were not so where would we be to-day? As it is now when the great majority of dentists get a new idea they gladly give it to their fellows, and that is the true spirit of the professional man. As a little illustration of this thought, I herewith present to this society a prescription for a mouth-wash which I have been working upon for a good many years. This is a strong preparation, and only a small amount is needed. It is very good for inflammation of the mucous membrane wherever located, but if used through the nose it should be weaker than for a mouth-wash.

Boracic acid.....	3 drams
Oil cassia.....	1 dram
Carbolic acid.....	1 dram
Chloroform.....	1 dram
Alcohol.....	3½ ounces
Oil peppermint.....	10 drops
Glycerin, q. s.....	8 ounces

M Sig. Put ½ teaspoonful in ½ glass tepid water as a mouth-wash.

Dr. J. N. Crouse, Chicago: I wish to compliment the essayist upon the eloquent manner in which he has expressed his thoughts, but I am obliged to differ with him in the position taken. He spoke of the freedom of the dental schools. I haven't discovered that dental colleges are offering education free; it is quite as expensive as any other line of schooling, but it should be paid for, as I don't believe in charity institutions except for the poor.

To take up the professions, lawyers are permitted to take out patents if they want to, and clergymen may copyright books in this or any other country, for a copyright extends to all countries in which it may be taken out. The fact that the medical profession don't take out patents is easily explained—they have nothing to patent. Surgical instruments are being patented, and surgeons are using patented instruments, because they are more perfected and better made than those that are not. I do not recall the case of any

professional man writing a book and not having it copyrighted, that is, if it were worth being published, for no publisher will take a book unless he is protected by copyright. Inventions are patented for the same reason. No manufacturer will perfect an appliance, and spend the necessary money manufacturing it and bringing it to the attention of the profession, unless he is protected for a reasonable length of time. By an invention I mean something with novelty enough in it to be given a valid patent. I can see no reason why a man with ability enough to invent new things should give his time and brains and energy without remuneration to the profession, which is not altogether appreciative. Furthermore, he can't give an invention to the profession, for what can the dentists do with it? They can't make the tool or appliance, and the fact that it can be patented makes it possible for that invention to be perfected, manufactured and put in our hands in a useful form. The essayist stated that the inventor claimed that a patent preserved the individuality of his invention, and he admitted that would be a good reason if there were not a remedy, but the remedy which Dr. Bentley gives is faulty. He states that if an invention is described before a dental society and published in its transactions it is preserved to the inventor. This is not the case, for if not patented it becomes public property after two years and any man can then do whatever he pleases with it. However, if it is a complicated piece of machinery no dentist can do anything with it, and no manufacturer will touch it, because he cannot afford to spend thousands of dollars in perfecting, manufacturing and advertising it when any other manufacturer can step in at any time and profit by his work, trouble and expense. Consequently, if the invention is not patented the profession lose the benefit which would come from its possession. One reason why the dental profession have made advances, and are each year better prepared to serve their patients, is because our instruments have been perfected to the highest degree, more so than surgical instruments.

However, I do not wonder that the dental profession have cried out against the patent abuses imposed upon them. Leaving out the case of the International Tooth Crown Company, which fleeced us with a lot of worthless patents, dentists are at the present time paying thousands of dollars to the supply houses on patents that would not stand a test in court. Just to give the profession an object lesson I put on the market the "Fellowship" broach at \$1.00

per dozen, to compete with the Donaldson broach, for which the S. S. White Co. had always charged \$2.50. The White Co. had had a monopoly because of the patent and had collected nearly \$200,000 in royalties, but I knew that the patent was no good, as I and a great many other dentists had barbed broaches before the Donaldson instrument was ever heard of. After a long fight the court decided that the patent was invalid. These are the kind of patents that I do not believe in, but patents on novelties are all right, and the inventor should be protected and rewarded. The essayist dwelt at considerable length on giving and receiving. It is a poor rule that will not work both ways, so I would ask what return the dentists make to the inventor who gives them the benefit of his work and ability without protecting himself by a patent?

Dr. G. V. Black, Chicago: Patents are purely a commercial arrangement, and as such have no business in a profession, but those things which we delegate to the commercial man to prepare for us should be patentable, but there should be no patent on office rights or on anything that must be applied to the human body to complete it. It is on the ground of expediency—what is best between man and man—that the patent right is established.

Dr. G. D. Sitherwood, Bloomington: Do you mean that an artificial limb or ear, or the making of a bridge or a plate should be patentable, or merely an instrument or something of that kind?

Dr. Black: The fitting of an artificial limb to the body and the application of a dental plate to the mouth should not be patentable, but there may be certain features of the substitutes themselves that are properly patentable.

Dr. Edmund Noyes, Chicago: If the different standards between trades and professions are mere matters of assumption, or conventionality, or custom, they are not of much consequence and need not be considered. It is simply because of the more important interests which are committed to the care of the professional man that his obligations to his profession and to the public are different from the obligations of a business man to his competitors and customers. It is more important that a patient should receive competent and honest service at your hands than it is that a man who goes into a hardware store should be given a stove that has been honestly made. The interests in the first case are so much more important that the professional man by common consent is under obligation to serve humanity with primary reference to its needs

and with secondary reference to his own compensation, while it is universally conceded, in fact if not in theory, that the business man has primarily to consider his own interests, and he may suppose that the customers with whom he deals are competent to look out for themselves. This is why a doctor must do many things that a mechanic or merchant is not called upon to do. Now we can readily see the importance of making distinctions between those patents upon office rights, or those which require some portion of the human body as an essential part of the patentable article or process, and those patents which relate simply to articles which can be manufactured and sold complete. No one will contend that a dentist or physician may not patent something which does not relate to professional service and profit, but he should be barred from taking out patents on office rights or processes, and I do not believe that he should patent an invention which relates to his profession. Why should the man who has made some mechanical invention like a clamp, or a pair of forceps, or an instrument for administering anesthetics, have any more right to profit by that invention than the man who invented the step cavity in filling teeth, or those men who have worked their whole lives and spent their money on experimental apparatus and scientific research—who perhaps have laid the very foundation on which some important material has been developed. For instance, in one case we know of, an alloy which is in almost universal use. Why should they give all this with absolute freedom to the profession? Why should Miller or Andrews or Cook work in the laboratory to find out about bacteria without hope of pecuniary reward when the same obligation does not apply to the man who invents a new instrument?

Dr. Crouse: Do they do that without remuneration?

Dr. Noyes: Practically they do. I should be very glad to know that Dr. Black has had the pecuniary reward from his work for the profession that he would have obtained had his time been devoted to his private practice. I am not aware that these men have received from the profession or from the public any direct pecuniary compensation for their work. If we are professional men, as distinct from merchants or artisans, we must assume some obligations and make some sacrifices which they are not called upon to make, and these sacrifices in respect to inventions are a part of our limitations and duties.

Dr. J. W. Corman, Mount Carroll: Would Dr. Black hold the

position he does to-day if he had not made the investigations he did years ago?

Dr. Noyes: The reward which these men have had is just as open to the man who invents an instrument and gives it to his profession, in proportion to the value of his contribution.

Dr. F. B. Noyes, Chicago: We do not hold the ideal of our profession high enough. It is altogether too evident that dental students consider that the money they pay for their education entitles them to carry away from the colleges everything that is not chained down, but no fee can pay the debt to our teachers. We owe something to them and to the long line of men who have devoted their lives to research for the profession. The man who simply practices dentistry for what he can make out of it is just as much a commercial man as the one who patents a device.

Dr. C. N. Johnson, Chicago: I think that a man has a right to patent an instrument, but I should rather see the patent taken out by the manufacturer than by the dentist. The statement is made that a dentist who spends his time to perfect a mechanism of value to the profession should be compensated, but just as much time has been spent by dentists in the study of the principles of practice that we are following to-day as in the evolution of our instruments, but I don't know of any instance where men have been paid for that particular kind of study. It requires a good deal of expenditure to perfect and bring an instrument before the profession, and if the dentist does the work he should be recompensed by the manufacturer who brings out the instrument.

Dr. J. E. Nyman, Chicago: If Dr. Bentley practices what he preaches he fills teeth for the cost of the material used. Our profession is a combination of art and craft, and we have to deal with practical things more than with fanciful ideals. A patent on a mechanical device is justifiable, and it isn't given to allow a dentist to satisfy his greed, but to repress the rapacity of the manufacturer. Unless the inventor can control his appliance it will be imitated in the cheapest sort of way, and then it won't do the work for which it was designed. Dr. Crouse would never have attacked the Donaldson patent if the broach had been sold at a legitimate profit. Dr. Bentley is wrong on copyrights, as a man can't translate a book into another language if it has been copyrighted in that language. These laws are passed to give people compensation for their work, and if you don't offer incentives to inventions you won't

have anything new. The only nations that don't have patent laws are half-civilized ones that haven't sense enough to get them up.

Dr. Bentley, closing discussion: Despite all that has been said I have not been swerved an inch from the ground I took in my paper. There can be no comparison between the ethics of a business and those of a profession. When a merchant deceives you as to the value of a piece of goods you suffer no physical injury, but are simply deprived of your money. On the other hand, when a patient comes to you he reposes full confidence in your ability and integrity, and if you deceive him he can have no choice in the matter, as he has no knowledge of your efficiency. *Dr. Nyman* said that we take our patents to hold the manufacturer in check, but the greed of the manufacturer is no greater than that of a dentist. I make the unqualified statement that it is unethical for a liberal profession to take out a patent on anything, be it instrument or method. The code of ethics of the medical profession states, in substance, that any physician taking out a patent upon an appliance to be used by his associates shall be considered ineligible for membership in a medical association. The medical profession has outgrown this matter of patents. Some may say that ours is a mechanical profession, but there are almost as many mechanical appliances used in surgery as in dentistry. I want to see a tendency created and supported whereby a man who has anything to give to the profession will give it freely and without hope of reward, save that which inevitably comes to the worthy. Where is the equity in the case between the man who exacts tribute for a patent and the one who spends his days in the laboratory hunting for nature's secrets? *Dr. Black* has used a dangerous word—expediency. There is always a right and wrong side to everything, and no question is ever settled upon compromise. This question of patents is not one of expediency but of right—right as measured in the larger sense—right to be ranked with the liberal professions. Even upon scientific instruments no patents are taken out, for scientists will not patent them, and the greatest telescope maker in the world never took out a patent. Each year men come into our colleges who have been educated in the business world, and when they graduate they carry those commercial ideas into practice. Sooner or later we shall have a lot of commercial dentists unless our educators show them that such ideas have no place in the profession. More attention should

be given in the colleges, in practice as well as in preaching, to the chair of ethics.

GENERAL NERVOUS MANIFESTATIONS IN RELATION TO THE JAWS AND TEETH.

BY GEORGE V. I. BROWN, D.D.S., MILWAUKEE. READ BEFORE SECTION ON STOMATOLOGY, AMERICAN MEDICAL ASSOCIATION, JUNE 10-13, 1902.

In a paper read before the Section on Neurology and Medical Jurisprudence of this Association in 1898, and this section in 1897, I outlined the theoretical propositions upon which were based methods of treatment adopted by myself in the care of nervous affections, intimately related to disturbance caused by the habit of grinding and clenching the teeth, many general, as well as local, manifestations being attributed to this etiologic factor. The term "jaw-strain" was used in the same sense as "eye-strain."

Attention was called to the fact that wherever the natural teeth remain in the mouths of patients suffering from nervous disorders, it is noticeable that the occlusal surfaces show abrasion, due to constant grinding and rubbing, the effect of extreme pressure brought to bear during paroxysmal muscular effort or long-continued, excessive pressure, a condition frequently resulting from hours of pain and suffering. This has frequent mention by writers as a marked symptom among those who are victims to the various neuroses, but in no instance do I find where an author has thought fit to reverse the order of things and make the habit of the jaws which is responsible for this condition one of the etiological factors in bringing about the disease, rather than a result, as it is generally held to be. This hyperkinetic condition of the muscles of mastication is undoubtedly due to irritation of the brain-centers governing these muscles, whether as a symptom of other neural disturbance, or *vice versa*.

Since the papers referred to were written, an almost continuous observation of such cases, and the practical application of these principles, have convinced me more and more that the importance of the subject is but little conceived by those who treat, as all must who treat at all, neurotics or even victims to nervous functional diseases of lesser degree.

It is difficult to convey a due appreciation of or even to satisfac-

torily account for general nervous manifestations, often due to dental irritation, slight thought it may be locally. Yet it has occurred repeatedly in my experience with patients, who have been relieved by treatment applied solely to the etiological factor, that where for any reason the exciting cause was allowed to return to the original state, or the habit of irritation by grinding certain affected teeth was permitted to be resumed, the symptoms of pain, hysteria, muscular spasm, neurasthenia, or whatever they might have been, returned at once, and again disappeared after local relief or correction was given.

The rationale of the jaw-muscle habit in its pathologic significance is thus explained. Whether central irritation be excited by some other primary disease and the peripheral irritation be a secondary result, or the local disturbance an exciter of the cortical centers, the effect as a factor in disease is manifested in several distinctly different forms, which are as follows: 1. Through the pterygoids a lateral grinding motion of the jaw of man takes place, which if pursued at night is easily noticeable by the grating sound, and usually attention is called to it. If, however, the masseter and temporal muscles are called into unusual activity, the result is that the jaws are firmly and tightly pressed together without sound, and therefore often unnoticed, the pressure varying in individuals from two hundred to two hundred and seventy pounds. With the jaws closed normally and occlusion perfect this force would be comparatively equally divided among the whole number of teeth. If, however, as usually happens in these cases, the jaws be shifted slightly to one side, a little forward or backward, then certain portions of the individual teeth are brought together and they alone must bear this tremendous force. Ordinarily the membrane surrounding the root is capable of withstanding a considerable amount of traumatic irritation. But by continued application of this pressure, especially when weakened through other general conditions, as of circulation or otherwise, the power of resistance becomes impaired, and one of two things must result—either a local disturbance, made manifest by elongation of the tooth and soreness to pressure (pericementitis), a not generally serious affection, accompanied sometimes by localized pain, usually comparatively easily remedied, or, as I have believed, a direct communication of this irritation to the larger nerve-trunks, to be by them carried to the other parts.

2. In deformities of the dental arch disarrangement of the teeth

must change the angle at which the stress of antagonism is applied. If the crowns or cusps occlude irregularly, whether upon the lingual, buccal or labial aspects, the bell-shaped or contoured natural crowns of the teeth are crowded together, and the pressure exerted by the muscles of mastication tends to crowd out of line the teeth so situated as to be most subject to this crowding effect. The roots, being conical in form, are likewise in some degree forced away from the apical portion of the alveolar socket, and though in the apical space (so-called) allowance is made for a limited amount of movement in the line of the long axis of the root, there nevertheless results a measure of nerve-stretching where the branches of the fifth communicate through the apical foramina.

3. Exhaustion. Eye-strain continues only in the day-time, whereas the jaw muscles work day and night, such patients being most weary upon awakening in the morning, and the pain being most marked at that hour.

4. It is only reasonable to suppose that, with the force of the jaws pressed tightly and continuously upon certain teeth, the moment such pressure is removed the immediate result would be a hyperemia of the pericemental and other vessels about the roots; frequent repetitions of this would bring about a chronic inflammation, evinced sometimes by interstitial gingivitis, and in others a low degree of inflammation that through peripheral excitation gives rise to many reflex symptoms.

5. When it is remembered that the lower jaw at birth is much larger than the upper, and that the bones of the face are much smaller proportionately at this period than the bones of the head, it will readily be conceded that that constant pushing upward of the wedge-shaped inferior maxillary between the bones of the superior maxillary, increasing its diameter posteriorly as well as laterally, must exercise a radical influence not only upon these, but also upon all the bones that are associated to form the nasal meati and the nasal septum which divides them. Thus the nasal, maxillary, lachrymal, ethmoid, inferior turbinated, palate, and sphenoid bones, which form the nasal meati, are affected in shape and relation by any force which would alter the position of their respective development; and in precisely a similar manner are the vertical plates of the ethmoid, vomer, the crests of the maxillæ, the palate bones, the rostrum of the sphenoid, and the nasal spine of the frontal bone, which combine to form the nasal septum, in all save

the triangular notch of nasal cartilage, changed by any misdirection of energy which may cause a deviation in this dividing wall from its normal position or form.

Both Talbot and Kiernan make clear the fact that periods of stress, as they denominate certain stages which markedly affect developmental and other physiological processes, have much to do with health and the form as well as the character of the growth of both mind and body of the individual. There seems to be little question as to the truth of these statements, and if so, then why cannot stress arising at any other period from a most common cause likewise affect nerve-functions and metabolic changes?

Kiernan says, with reference to stress at the time of the eruption of the first molar, "In no small degree the struggle for existence during this period of stress centers around the development and eruption of the first molar. With the eruption of this tooth, premature puberty, sexual precocity, epilepsy, gout, insanity, rheumatism, obesity, and other nutritive degeneracies may occur. All have been charged to the eruption of the first molar, whereas its irregular or difficult eruption is, like them, an expression of constitutional stress. Hygiene at this period means also constitutional mental and moral hygiene. Epilepsy, for example, is not a disease, but a symptom of weakness of certain vasomotor inhibitions. The first convulsion does not constitute epilepsy. Through a law of the nervous system, nerve action, once aroused, tends to repeat itself. In this way are established normal and abnormal habits, of which last epilepsy is one. In its early stages a habit, normal or abnormal, is easily checked. The first convulsion could therefore be prevented were its premonitions known. A recurrence could also be prevented were its constitutional origin recognized. Observation of the general constitution at this time, because of the irregular eruptions of the first molar, would enable the physician to nip epilepsy and many other allied conditions in the bud. Reflex notions, however, must be flung overboard. All irritations should be removed and any constitutional irregularity treated."

If periods of stress so exactly correspond to the different stages of dental development, intra and extrauterine, and if, as has been shown, there are stages in the life of the individual which are marked by the onset of a predisposition to such perversions of nervous activity as are indicated by the investigations of Kiernan, corroborated by similar results reported by Talbot, then the in-

fluence of irritation of the neural mechanism of the teeth can neither be questioned nor ignored as a factor in neurology. It doubtless is an error to suppose that the eruption of teeth at a specific period coincident with the beginning of epilepsy, or any other manifestation of psychopathic or neuropathic condition, is the cause of such disturbance; that the real difficulty attending dentition is itself brought about by the same cause as the disease; but since it is, as a rule, absolutely impossible for the therapist to attend prenatal conditions, the point of vital interest and of value to him is that the correlation of the mouth, teeth, and jaw physiological and pathological processes to nervous affections, in one form or another, is almost invariably the rule; that at least in a large majority of cases a measure of relief can be given, and every means of assistance certainly should be opened if the overwrought, highly irritable and hypersensitive nerve-centers are to be given opportunity to rest and regain their normal equilibrium.

Dr. Daniel R. Brower says, "The prophylaxis of epilepsy demands much more attention than it ordinarily receives. A convulsion in the infancy of a child of neurotic inheritance is often the first manifestation of an epileptic tendency, and deserves serious attention. Children of this tendency should be relieved from severe nervous and mental strain. They should be kept from the use of alcoholics, opiates, coffee, tea and tobacco in early age and adolescence, and from sexual irregularities and excesses. Phimosis, errors in vision, diseases and deformities of the upper air-passages, or any other abnormality, may demand attention and correction." Surely, if such minute prophylactic measures are necessary, the ever-present, active irritation of jaw-clinching and grinding cannot be overlooked, and if carefully attended to would undoubtedly assume an importance far beyond present appreciation.

Dr. Harold Moyer says, "To my mind the central point in the diagnosis of neurasthenia is the presence of the fatigue symptom. Rest is the sheet anchor in the treatment of neurasthenia." Complete rest must comprehend, in the light of what I believe the future will reveal, a consideration of the special muscles now under consideration, as well as others more generally understood.

Without exhaustive reference to authorities, or quotations from the literature of pathologic neurology, which might be continued *ad infinitum* in proof of the fact that unusual activity of the jaw muscles is an almost invariable symptom associated with disease

of this nature, it seems advisable to deal directly with the evidence of practical results in the treatment of cases.

Miss C., aged twenty-five years, unmarried, anemic, very nervous, tall and thin; affection of the throat under treatment for some time without relief. Pain in occipital region most severe, but during the attack would spread to the frontal and other regions of the face. Nervous storms of this character were quite severe and of frequent occurrence. Correction of occlusion by grinding, particularly the tooth most affected by the habit, gave relief. Result: gained thirty-five pounds in flesh, and has almost entire freedom from pain.

Mrs. M., aged about fifty years. Family of four children; history of many years of headache with short intervals of freedom from pain; attacks showed tendency to increase in severity and frequency at the time my treatment began. Support was given by the aid of an upper plate, constructed in such a manner as to relieve the anterior teeth from the strain of occlusion. Result: almost complete freedom from pain for several months past, notwithstanding severe trial by illness of one and surgical operation upon another of her family.

Mrs. T., mother of a family of children grown, and a grandmother. Thin, anemic and very nervous. Treatment consisted in corrected occlusion, and fastened teeth loose from pyorrhea. Result: increase of ten pounds in flesh, and general improvement in health.

Miss M., aged twenty-five years. Tall, well-formed, but history of headache almost constantly for many years; sometimes very slight, but on the least unusual effort of excitement very severe; digestive disturbances quite marked; many kinds of food could not be tolerated; susceptibility to irritation very great; during the more serious periods of pain drugs were frequently used to give relief; both upper and lower arches were regular, except the failure to erupt a right superior bicuspid, which caused slight disarrangement of occlusion. *Treatment*—Habit of clinching the jaws in subconscious moments and during sleep made it necessary to insert a soft rubber pad to protect and relieve the irritating influence of direct tooth antagonism in occlusion. This was and is worn constantly at night. Steady pain has entirely disappeared. Recurrent attacks seem to have nearly ceased. Stomach has lost its

irritability, and at this time (after many months) the patient seems quite well; general health and spirits uncommonly good.

Miss —, aged — years. Extreme nervousness, manifested in a variety of ways; anemic; lower arch crowded; grinding habit marked, and reported by her sister to have been unpleasantly noticeable during sleep. Appliance was adjusted to expand the arch, thus to give more room for the teeth, and in this way to remove the stress by relief of pressure from crowding, also to make occlusal irritation impossible. Result: complete disappearance of the unpleasant symptoms, full restoration to health, and considerable increase in flesh. After several months the appliance was removed with the purpose in view of ultimately being able to dispense with its assistance. In a short time there was a return to the former condition, which is again being relieved by the use of the appliance.

Miss F., aged thirty-three years, came in charge of an attendant, almost unfit to be alone, because of mental disturbance, notwithstanding the fact that a history of the case showed a number of months' treatment in a sanitarium without relief. Family history fair; a suspicion of specific history on her father's side, he having died of hemorrhage thirty years before. Her mother died of uremia, and was morphin subject. *Previous History*—She was an only child; scarlet fever at the age of five years; her ears commenced to discharge two years later, and continued discharging until two years ago. She had grip one year previous to my seeing her. She had been a mouth-breather since she could remember, and when first seen was just convalescing from a severe attack of nervous prostration. She sought relief from deafness, and to regain health sufficient for the continuance of her occupation as dress-maker. *Treatment*—A saddle-shaped upper arch was widened, and occlusion with the lower made as nearly perfect as practicable. Nose and ear treatment was thus facilitated, with extremely gratifying result. She was able to dismiss the attendant after about ten days' treatment. Six months later she reported herself quite well, increase in weight fifteen pounds, and able to work regularly without ill effect. This patient has since married and seems to be entirely cured.

Mr. H., aged about fifty-five years. Family history not very clear. A brother's child was mentally defective. Married and had several children, all in good health, as far as could be learned.

Patient powerfully built, and aside from the peculiar affection from which he suffered was in good condition; a moderate drinker of beer; no intemperance so far as could be learned. The pain had begun in the left side of the face five years before he came to me in July, 1900. The symptoms are best described by reference to the illustration, which shows the distortion of the facial and eye muscles upon the affected side, which took place during paroxysms of pain. These came and went at intervals of about one and a half to three minutes. At the time of my first treatment, and for a few months before that date, the symptoms had extended to the throat, the hyperesthesia making it almost impossible to swallow even liquid involving the pharyngeal muscles, and thus exciting excruciating pain. Upon examination it was found that all of the teeth of the upper jaw, from the left superior central incisor back, had been extracted in the hope of giving relief. The remaining tooth was elongated so that it extended below its next neighbor, the right superior central incisor, about one millimeter, and this notwithstanding the fact that the incisal portion showed the effect of abrasion very much, having been worn away by the grinding of the teeth of the lower jaw, which also accounted for the elongation, due to thickening of the pericementum about the apex of the root. In order to give temporary relief, operation was performed with the surgical engine, by opening into the superior maxillary bone and severing the anterior branch of the trifacial. The pulp was removed from the left superior central incisor, and it was ground down so that it could no longer meet the teeth of the lower jaw in occlusion. All of the symptoms have disappeared. Twice since the time of treatment the patient returned with slight premonitory attacks of pain in the same region, and it was found that the affected incisor had worked its way down until it was again striking the lower teeth. Each time it was ground slightly, the relief being immediate and complete.

Miss F., aged thirty-five years, August, 1900. Family history unknown; height about five feet six inches; thin, anemic. Burning sensation and hyperesthesia of left side of tongue, which had begun about twelve months previously and had steadily increased. Six months later the same sensations were experienced in the throat, extending entirely across, and becoming so marked in severity as to threaten a complete nervous prostration. Upon examination an ill-

fitting piece of bridgework, extending from the left superior cuspid to the first molar upon the same side, showed to a very noticeable degree the marks of the grinding habit due to evident malocclusion. Removal of the exciting cause and correction of occlusion gave relief. The patient reported in June, 1902, entirely free from the old symptoms and in good general health. Her weight, which was one hundred pounds at the time of the beginning of treatment, increased to one hundred and twenty pounds, with a complete disappearance of all nervous manifestations.

Mr. —, aged about twenty-five years. Paralysis of the right side of the face had come on gradually, having first been noticed about seven or eight days before coming under my care. Careful examination by a neurologist failed to show a reasonable cause for such a condition. Patient's health seemed to be good; reflexes were found to be normal, and as he was not at all alarmed about his condition, there seemed to be no psychic element which could be held accountable. Examination of the eyes by an oculist failed to discover any exciting cause in that direction. Upon examination it was found that through malformation of the jaws only the molars met in occlusion, it being impossible for the patient to bring the anterior teeth into contact at all. In the hope that some relief might be given, the molars were ground down sufficiently to equalize the stress of occlusion. No other treatment was given. The symptoms began at once to disappear, the muscles regaining their normal usefulness in the same manner that it was lost to them.

How far it is either safe or wise to claim dental or maxillary irritation as exciting causes in such cases as the last one described I do not know. One other case of paralysis of the facial muscles, that had continued for a much longer time, the patient being a young married woman without children, and without, so far as could be learned, specific disease, in whom the grinding habit was very marked, was given a very considerable measure of relief immediately by extraction of a lower molar, which it was deemed wiser to extract than to attempt to treat under such grave conditions. Full restoration to usefulness of the muscles upon the affected side returned shortly after the alveolar socket had been healed. In another, a young lady aged about twenty-two years, there seemed to be a particularly intimate association between a paralysis of the entire right side, including the extremities, which

lasted for several months, and was most puzzling to the physicians in charge, because no brain lesion could be diagnosed, although for a long time it was believed that the etiologic factor was of that nature. Her recovery, however, would seem to have disproved such a theory.

Many such cases as the ones described could be cited that have come under my care during the last five or six years, and though results were not always as markedly successful as might have been desired, nearly all patients have been materially benefited, and other more general treatment assisted, while a very considerable number have been cured without other therapeutic measures. I am fully aware of the psychic element that is omnipresent in dealing with neurotics, and am also sufficiently impressed with the idea that one is apt to find too much in his own special field. Therefore it is my wish to emphasize in conclusion the following summary: The jaw habit may in some instances be an etiologic factor in functional nervous disarrangements, or more often perhaps only a symptom. But in the therapeusis of such diseases every method of treatment might reasonably be made more effective if its correction received due consideration. No dogmatic rules can be laid down by which ill effects of this muscle habit may be overcome. Careful study of individual characteristics requires the adoption in different instances of a great variety of methods, simple in themselves, yet requiring the greatest care and delicacy in order to be effective. One of the simplest and most beneficial appliances, quite harmless and yet capable of very general and useful application, is a hard rubber plate, with soft velum rubber border extending over the occlusal surfaces of the teeth. The palatal portion gives a sense of firmness and security, and the soft rubber covering to the crowns of the teeth makes grinding or serious injury by undue irritation impossible. It need be worn only at night, and thus gives little serious inconvenience to the patient if carefully adjusted.

A consideration of the methods of treatment would require much more than the limits of this discussion prescribe, but every one who undertakes the application of any corrective measures to the dental organs should remember that in the highly sensitive state common to these patients it is quite as easy to do harm through failure to perfect the occlusal mechanism as it is to benefit by accuracy and manipulative dexterity.

DENTAL NOMENCLATURE—WITH REFERENCE TO ITS DEVELOPMENT, BEARING ESPECIALLY ON THAT OF DESCRIPTIVE DENTAL ANATOMY, CAVITIES AND INSTRUMENTS.

BY G. W. DITTMAR, D. D. S., CHICAGO. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

The development of dental nomenclature very naturally has impressed upon it the characteristics of the growth of the profession. It is a historical fact that dental operations were performed thousands of years before the Christian era, yet it was not until a trifle over a half century ago that the dental art assumed the dignity of a scientific profession. Likewise with dental terminology, a few specific terms necessarily were employed, but most of these were vernacular and unscientific in their application.

It is unquestionably true that the nomenclature of any art or science is not a creation per se, but a slow and steady growth, which starts from a small beginning and develops gradually. Up to fifty years ago dental terminology was in an embryonic condition. Since then the development of the dental science has been so rapid that many of the terms chosen to convey the necessary ideas have unfortunately been selected without a proper regard for their fitness, and thus we have a multiplicity of words used to designate one and the same thing, terms really inapt, wrongly applied, or etymologically incorrect.

This deplorable condition was caused to a marked degree by numerous instructors in dental colleges and writers of dental literature, working at about the same time, who in endeavoring to describe the ever-developing facts and ideas found it necessary to frequently coin new words or make new applications of existing terms. Though realizing the need of a uniform and adopted nomenclature, many of these men, having introduced and used their particular set of terms, many of which were unscientific and inaccurate, clung to them as a workman clings to old and long-used tools in preference to superior new ones with which he is unacquainted.

Realizing the chaotic state of affairs, and also that "in scientific statements or descriptions exactness and precision of language is of the utmost importance," the American Dental Association in 1876 appointed a committee of three, consisting of Drs. Jonathan Taft,

Wm. H. Atkinson and Homer Judd, on Dental Nomenclature and Terminology. This was the first concerted effort to establish a uniform nomenclature, and in the following year Dr. Atkinson submitted a report on the subject. In it he made but a slight attempt at producing a definite starting point for so gigantic and necessary an undertaking, though the report contained some excellent suggestions, from which I take the following: "We may lay it down as our first business, as founders of nomenclature, if we seriously undertake that task, to keep clear of special theories in respect to facts, and about which there is or may be dispute, and confine ourselves strictly to furnishing the instruments, or that armory of vocal implements, by which anybody whosoever, with whatever theory or opinion, may be able to present intelligently his ideas to all others."

Instead, however, of confining himself to dental nomenclature he introduced and in several subsequent reports continued the presentation of Universology, which is the science of universal classification, and "Alwato, or the science of the natural and appropriate naming for all the results of classification, in whatsoever department. As music has laws, which had to await their discovery by human observation, so it is now discovered that the true laws of language have always been latent in the organic structure of the organs of speech, and Alwato is the one language for all the world, which is to result from the full discovery and practical coordination of those laws." If it had been or should be possible to devise, adopt and put into application "Universology and Alwato" for the purposes of general scientific nomenclature, it would indeed be a boon to our own as well as to all other scientific callings, but it seems the labors of Dr. Atkinson were not appreciated; possibly they were premature—at any rate dental nomenclature as it exists to-day has profited little by his scholarly efforts.

In 1885 Dr. W. O. Kulp submitted to the American Dental Association a very excellent report, in which he recognized the lack of system and the necessity of a uniform dental terminology. Though his report was brief, confining itself to descriptive dental anatomy, it dealt with words which have formed the nucleus of our present dental nomenclature. Unlike the previous reports on this subject, it received commendable consideration and elicited a healthy discussion.

Nothing of much note was again submitted to the profession until 1893, when at the World's Columbian Dental Congress Drs. G. V.

Black, W. O. Kulp and Garrett Newkirk presented papers which have proved to be the corner-stones upon which our present dental terminology is based. Dr. Black in his very excellent report discussed in a most thorough and convincing manner the need for a definite system of nomenclature, the general principles underlying its development, and the fixing of a scheme or standard of beginning, suggesting the following: "1st—The plan of nomenclature shall be the same in the several languages. 2nd—Use words derived from the Latin or Greek, whenever such words are available, making use of the root, and giving it such terminations as may be suited to the language in which it is employed. (Note. When a word in the Latin or Greek form has come into favorable use in any language there will be no necessity for changing it to the vernacular form.) 3rd—When for any purpose a word from the Latin or Greek is not available, agree upon a word from another language and use in the same way. 4th—When it is impracticable to use the same word in the several languages, these should be as nearly exactly translatable as possible. 5th—Adopt such general and specific rules employed in other sciences as may be adapted to dental nomenclature. 6th—Create such specific rules for the naming of things discovered in the future, as shall secure their universal use and prevent the duplication of terms. 7th—Make rules for the translation of names arising in one language, which from their form or for other reasons cannot be used in some other language."

An appended exhibit of the nomenclature of dental anatomy, compiled from the works of eleven authors, showed plainly the superiority of Dr. Black's over any of the others, which were more or less incomplete in classifying and naming the teeth; naming their parts; roots; surfaces of crowns and surface markings; the pulp and peridental membrane; names of cusps and angles, and the expression of directions. An exhibit of the general plan of naming carious cavities was also added, which classified cavities, and following this, cavity wall nomenclature; the depth and angles of cavities; the division of teeth into thirds, for the purpose of intelligently locating a certain position, and words used to properly describe the cavities in teeth, were each made interesting topics.

Dr. Kulp's paper covered much the same ground, he having elaborated extensively along the lines he presented in his report in 1885. While to a marked extent it agreed with that of Dr. Black, and on the whole showed careful preparation, yet he introduced some very

cumbersome combinations. For example, he spoke of the "third molo-buccal margin of an upper second molar," instead of the "disto-buccal angle;" and of the "third molo-proximal surface of an upper second molar," instead of simply the "distal surface" of an upper second molar.

Dr. Newkirk's paper dealt with the nomenclature relating to forms of the dental arch and special positions of the teeth. Some new and excellent thoughts were presented, and a number of newly applied terms suggested, which certainly were more concise, definite and self-explanatory than those previously used.

In 1894 the American Dental Association adopted a resolution providing for the appointment of a special committee of nine, to be known as "The Committee on Terminology," whose duty it should be to compile and submit a carefully prepared report at each annual meeting of the Association. This committee consisted of Drs. S. H. Guilford, M. L. Rhein, T. E. Weeks, C. L. Goddard, Grant Molyneaux, Louis Ottofy, A. H. Thompson, D. R. Stubblefield and E. C. Kirk; and they saw fit to build to a great extent upon the corner-stones contributed by Drs. Black, Kulp and Newkirk. In 1895 this committee submitted to the Association a report which contained 506 technical words, alphabetically arranged, designating the parts of speech and giving their proper pronunciations and most applicable definitions, taken from such dictionaries as the Century, Dunglison, Gould, Thomas, Webster and the Standard, and from such writers as Tryon, Cope, Owen, Scott, Black and others. It was indeed an admirable effort, and formed a solid foundation upon which a truly dental nomenclature is gradually building. The following year this special committee submitted a similar report, comprising 136 words.

In 1897 the American and Southern Dental Associations united, forming the National Dental Association, which, in order to further develop the work so well begun, adopted a resolution providing for the appointment of a standing committee of three, whose duty it should be to submit at each annual meeting a carefully prepared report on dental terminology. The succeeding year Dr. W. E. Walker read a paper on "Cast and Model," and at the next meeting another on "Articulation and Occlusion," which, while not developing anything new, carefully and thoroughly covered the ground. Since then nothing of importance has been submitted to this Association.

Another potent agency in reforming and establishing a more uniform and acceptable terminology was the organization in 1893 of the "National School of Dental Technics," now known as the "Institute of Dental Pedagogics." This organization of dental instructors and authors, meeting annually, and exchanging views, made it necessary for them to adopt terms as nearly uniform as possible, and the effect of this in improving conditions has been manifest by its influence upon the thousands of students attending the numerous dental colleges.

Dr. D. M. Cattell, in a paper on "Operative Technics" read before this body at its first meeting in 1893, called attention to the importance of having students familiarize themselves with all the ordinary dental technical terms, so as to be able to comprehend their meaning, properly pronounce, and use them intelligently in the construction of sentences.

In 1895 Dr. Cattell in "A Talk on Instrumentation Technics" entered a new field, by introducing a scheme for a systematized nomenclature and classification of dental instruments.

Dr. Black three years later presented a paper along these same lines, elaborating extensively on the scheme introduced by Dr. Cattell. In this report, published in the DENTAL DIGEST for January, 1898, he not only classified instrument names, but presented concise and definite principles for the construction, classification and naming of instruments. He devised a simple and accurate method of describing an instrument by a formula which consists of three numbers—e. g., Hatchet excavator 12-5-6; the first number (12) representing the width of the blade in tenths of a millimeter, thus designating it to be 12-10 of a millimeter wide; the second number (5) representing the length of the blade in millimeters, and the last number (6) the angle of the blade in relation to the long axis of the shaft, given in centigrades.

Excavators were divided into three lists—Ordinaries, Specials and Side Instruments. (Note. This classification is from a revised list.)

Ordinaries	{	Hatchets.
		Hoes.
Specials	{	Chisels.
		Spoons.
		Enamel Hatchets.
		Gingival Margin Trimmers.

Side Instruments { Discoids.
Cleoids.
Extra specials not belonging to the regular special list.

The ordinaries are made in six sizes, ranging from 4-10 of a millimeter wide and 1 millimeter long (4-1) to 14-10 of a millimeter wide and 6 millimeters long (14-6), and each size is made in four different angles, viz., 6-12-18-23 centigrades.

Thus: 4-1-6, 12, 18, 23
6-2-“ “ “ “
8-3-“ “ “ “
10-4-“ “ “ “
12-5-“ “ “ “
14-6-“ “ “ “

The six sizes in four angles make 24, and these, made in two classes, viz., Hatchets and Hoes, make 48 instruments, which constitute the entire set of Ordinaries.

You will notice that the first number in the formula for the smallest instrument is 4, and that these first numbers increase in a two-fold ratio up to and including 14, viz., 2, 4, 6, 8, 10, 12, 14, and that the second number is 1, and that these increase in a single ratio, viz., 1, 2, 3, 4, 5, 6; and that each size is made in four different angles—6-12-18-23.

The Specials are made in three sizes and two angles, viz.,

10-6-6, 12
15-8-“ “
20-9-“ “

Note. Straight chisels are included under Specials. Binangled chisels are made at an angle of 6 and the rest of the Specials at an angle of 12 centigrades only.

The Side Instruments can be made to any definite formula.

The following rule for designating “rights and lefts” in instruments was introduced: “The instrument which when held as a pen, with the point downward, has the convex side of the blade to the right is called a right-hand instrument; and the blade which has its convex side to the left is the left-hand instrument. In beveled rights and lefts the beveled side corresponds to the convex side of curved blades.”

By means of this very simple and accurate instrument nomen-

clature dentists can now definitely designate their wants. The system is scientific and broad enough to be applied to almost all dental instruments. Pluggers, burnishers, finishing knives, files, etc., can all be given their proper formulæ, and when these are given in connection with the rest of the nomenclature, which for convenience in teaching has been divided into

Order names	{ which designate the <i>use</i> of the instrument, as plugger, excavator, burnisher, etc.
Suborder names	{ which designate the <i>manner, position, or purpose</i> of use, as enamel hatchet, gold plugger, etc.
Class names	{ which describe the <i>working point</i> of the instrument, as hatchet, hoe convex-faced, serrated, etc.
Subclass names	{ which designate the <i>number of angles</i> leading to the working point, as monangle, binangle or triple angle,

the student, office assistant, fellow practitioner, or instrument-maker understands us exactly when we say, "Give me a monangled hatchet excavator 6-2-12," or a "triple-angled hoe 12-5-23."

To my mind no one factor has been so potent in simplifying and making uniform the teaching of instrumentology and cavity instrumentation, as well as having produced the manufacture of scientifically formed instruments, as the work on instrument nomenclature introduced by Dr. Cattell and so thoroughly completed by Dr. Black.

At the Philadelphia meeting of the Institute of Dental Pedagogics, in 1899, a committee consisting of T. E. Weeks, D. M. Cattell and J. A. Dale submitted a syllabus on Operative Technics, which comprised the most complete report on operative dental nomenclature yet presented. Systematically arranged charts, embracing all the latest and most appropriate terms used in descriptive dental anatomy, instrument and cavity nomenclature, were included. It was the last and the best work on the subject ever presented.

It has been my aim in this paper to review briefly the progress that dental nomenclature has made, especially since it was taken under consideration by the two great national organizations referred to. Some admirable work had been done previous to this time by such men as Jourdain, Tomes, Harris, Hayden, and numer-

ous more recent writers, by whom many of our present terms were employed. We also noticed a unique monograph, more especially on the nomenclature of dental anatomy, written by Dr. Judd and presented to the St. Louis Dental Society in 1876. All these had their influence, but the two organizations of which I have spoken, most of whose active members are either instructors in colleges or writers of dental literature, have been instrumental in bringing about the gratifying results manifest during the last decade.

While there now exists a nomenclature which is for the most part simple, scientific and accurate, especially from the standpoint of operative dentistry, much yet needs to be done to eliminate the unscientific and inaccurate terms which cling to the other like barnacles to a ship and impede its progress. I refer to such terms as "Sixth year molar," "Twelfth year molar," or worst still, "Six year old molar," "Twelve year old molar," "Wisdom tooth," where "First permanent molar," "Second permanent molar" and "Third molar" should be used; the use of "Eye tooth" and "Stomach tooth," for "Upper" and "Lower cuspids" respectively, "Nerve" for "Pulp," "Dead tooth" for "Pulpless tooth," "Ulcerated tooth" or "Gum-boil" for an "Alveolar abscess," "Fang" for "Root," and many other equally unscientific and incorrect terms; or such inaccurate expressions as "Double teeth," where "Molars" are indicated, or "Crooked teeth," where "Malposed teeth" should be used, or to say "the second tooth came inside or outside of the first," when instead of so unscientific and absolutely wrong an expression we should say, "The permanent tooth erupted lingually, or labially, or buccally of the temporary tooth."

In a paper of this nature it would be too great an undertaking to review the development of the nomenclature of prosthetic dentistry, orthodontia, dental pathology, materia medica, therapeutics, and the numerous kindred subjects, so in passing I will simply say that the nomenclature of these subjects has also made marked progress in the past quarter of a century, but that there too exist many unscientific terms and expressions which need to be eliminated and more accurate ones adopted instead.

To further remedy and finally establish a uniform national dental nomenclature, I believe the course to pursue in the future should be similar to that followed in the past, in that the selection, but more especially the *adoption*, of new and newly applied terms should be made only through the recommendation of the National Com-

mittee, after its due and careful deliberation, and then if every dental teacher and writer of dental literature would adopt such terms, as well as the profession generally, it would be but a comparatively short time before the ideals of the pioneers of this magnificent though laborious undertaking would be realized.

In conclusion, I append a list of nouns, adjectives, and a few verbs, which constitute the technical terms from which our present descriptive dental anatomy and cavity nomenclature is taken:

Nouns.—Anatomy, Angle, Alveolus, Apex, Arch, Axis, Bicuspid, Canal, Cavity, Cementum, Cervix, Chamber, Cingulum, Contact, Curvature, Cusp, Cuspid, Dentin, Edge, Embrasure, Enamel, Fissure, Fossa, Foramen, Gingiva, Groove, Gum, Horn, Incisor, Inclination, Line, Lobe, Margin, Membrane, Molar, Neck, Pit, Plane, Point, Process, Pulp, Ridge, Root, Septum, Space, Sulcus, Surface, Thirds, Tooth, Tubercle, Wall, Wrinkle.

Adjectives and Prefixes.—Apical, Axial, Anterior, Buccal, Bell, Cavo, Central, Conical, Deciduous, Dental, Developmental, Distal, Fifth, First, Five, Foraminal, Four, Gingival, Incisal, Inferior, Inter, Labial, Lateral, Left, Lingual, Lower, Marginal, Middle, Mesial, Multiple, Oblique, Occlusal, Peridental, Permanent, Posterior, Proximal or Proximate, Pulpal, Right, Secondary, Second, Single, Sub, Succadaneous, Sulcate, Supernumerary, Supplemental, Third, Three, Transverse, Triangular, Temporary, Upper.

Verbs.—Articulate, Calcify, Occlude.

In combining these terms, making compound words, the final "al" in all but the *last* adjective is substituted with "O;" thus, in combining "mesial" and "occlusal" it should read "mesio-occlusal," or in combining "buccal," "gingival," "axial" and angle, it should read "bucco-gingivo-axial angle," etc. Thus by properly combining these words all the descriptive terms necessary can be formed to accurately convey to the reader or hearer exactly the thoughts intended.

Discussion. *Dr. F. B. Noyes*, Chicago: In writing upon nomenclature some men have tried to create a complete new system of descriptive words, but such efforts have "died a-borning." The conspicuous thing in the writings of Dr. Black is that he has reviewed the words which were in common use and has picked out those which seemed most clearly and concisely to express the necessary idea. The words which he has coined are comparatively

few, and only where no word existed to cover the idea. After a selection of this kind has been made and tested, and has been recognized by the representative organizations of the profession, it becomes not only the privilege but the duty of the profession to use those words and drop all others. It is our duty to know, understand and use those technical words which have been established by the national bodies. The dental profession has been criticised for its propensity to coin words, as each writer seems to never be satisfied, but to hold it his privilege to select a new word to express an old idea. This merely causes confusion and is futile.

The efficiency of an instrument depends upon three things—the width, the length and the angle of its blade. If we think definitely about our instruments we select the right one to do a certain piece of work, but if we think vaguely about our instruments we guess at the shape required and pick up several before we get the right one, thus wasting time. The training of ourselves to use and understand instrument nomenclature in practice is the surest way to rapid and correct cavity preparation. The rapid operator will make a filling with three or four instruments while a slow one will have his cabinet turned inside out.

Dr. A. D. Black, Chicago: The title of this paper indicates very clearly what the author is writing about, and I wish to congratulate him, as titles do not generally do this. In dentistry we have three distinct nomenclatures: First, one for comparative dental anatomy, which applies to the teeth of man and other animals, and is based on the development of the various tooth forms from the primal protocone; second, one for human dental anatomy, which applies more particularly to the minute description of the teeth of man; third, the nomenclature, if we may call it so, between dentist and patient. This last is accountable for our retaining many of the old phrases, and if we would explain some of these words a little more carefully to our patients the majority of them would be glad to use the right terms.

The subject of instrument nomenclature is one which has never before been presented to this Society, and the essayist has necessarily gone over the ground so hurriedly that I doubt if those members who are not familiar with the subject will get much out of that part of the paper. I would suggest that all would do well to study this question, as Dr. Noyes has said, for with it one can

operate faster and more accurately. It isn't necessary to have a complete set of instruments, as you can take almost any portion of the entire number and have a set that is complete in itself and satisfactory.

The future development of dental nomenclature rests with three agencies, namely, the Institute of Dental Pedagogics, the dental journals and the dental societies. Perhaps the first is the most important, but journals cut a considerable figure, and in view of this morning's discussion, showing how much license an editor has with a paper presented to him, I would suggest that an occasional editorial on the papers appearing in a journal might be a good thing. Perhaps, also, it would be well to have a committee to submit a report on the nomenclature used in the meetings of this Society, simply as a friendly criticism.

Dr. D. M. Cattell, Chicago: I wish to say that the ideas in the talk on instruments and instrumentation which I made before the National Association of Dental Technics were gotten from Dr. Black, and it was with his consent that the matter was brought out at the time. A few years ago an eminent teacher said that "the sign-board of a profession is its nomenclature." If that is true, how careful we should be of our sign words. Another prominent writer has remarked that "If a man knows the nomenclature of his profession he is well acquainted with the subject or subjects of his profession," so that using the proper terms would indicate that we are well versed on the subject of which we are talking.

Dr. G. V. Black, Chicago: It might be inferred that a distinctly dental nomenclature is newer than it really is. As a matter of fact, we are more indebted to John Tomes for the nomenclature that we are using to-day than to any other man. Not that he wrote any treatise on dental nomenclature, but in his writings upon dental subjects he introduced the words which formed the basis of our present nomenclature. He introduced the words "mesial," "distal," "buccal," "lingual," etc. Owen gave us the word "dentin." Our nomenclature is to-day used largely by the French, but, while it is generally understood by German dentists, it is not used very much in that language. Eventually, however, we will understand this language of dentistry, no matter in what tongue we may hear it.

Dr. J. N. Crouse, Chicago: How far are the different colleges in harmony on this instrument scheme? Of course, if the various schools will agree on a system and a style of instruments, the boys

will all adopt same and in a few years it will be universal. I can see the value of having a uniform system of instruments in all the colleges.

Dr. Black: I am responsible for this instrument nomenclature, and my idea has been to introduce a system whereby we may arrive at definiteness in teaching. There are already a number of schools using the system, and it is only a question of time before it will be universal. We do not expect the older practitioners to take it up, but the boys in the schools, the faculties of same and the more recent graduates have learned it. Any of them can talk together about instruments and know just as definitely the particular instrument that the other refers to as one carpenter would know what another meant if he spoke of a three-quarter-inch auger. It is necessary that one should realize the value of the millimeter in order to read these forms easily and definitely. I worked over the matter for a long time trying to use the parts of an inch for a measure, but the millimeter as a unit is far preferable. Where an old practitioner does not want to change his instruments it would be an easy matter to stamp the respective formula upon those which he likes to use.

Dr. Dittmar, closing discussion: It has been stated that you probably would not understand the subject of instrument nomenclature very thoroughly by simply hearing my paper. That will apply to the paper as a whole, for I could only consider the matter in a general way. I purposely did not consider comparative dental anatomy, because of the magnitude of the subject and because it does not play so important a part in the vocabulary of the average dentist.

GOOD FELLOWSHIP.

BY C. R. TAYLOR, D.D.S., STREATOR, ILL. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

One of the strongest elements that has always worked for the success of our state dental society is the bond of good fellowship among its members. This factor was prominent in its organization and was clearly recognized at its inception by the first evening of each meeting being set apart for social intercourse and fraternal greetings. And it should be our purpose at each meeting to show our good will and appreciation of each other by cultivating that

fraternal spirit which will lead us to regard those engaged in the same professional calling with feelings of generosity and noble regard, which can be known and grown only by association and fellowship. Good fellowship is dependent upon good ethics, and there can be no good ethics without a proper consideration of "the other fellow." Good fellowship is the synonym of right living. There can be no high professional attainment without a true professional spirit, and that spirit is largely dependent upon associated effort. We are not to be satisfied with professional skill or individual morality and ethical conduct, for our age demands the highest attainment of skill, morality and ethical culture from us as a profession. We then owe it to our profession, and we should work for the highest social and ethical standard among the members at large.

There is no particular virtue in asceticism. Even old Diogenes with his lantern had to get off his perch to find an honest man. Character is not perfected in isolation. Life is not a mechanism to be set apart and left to run automatically. Life is a purpose; an involution of spiritual forces needing the energizing influences of personal association for its complete evolution. All life and form is dependent in some way upon association. No one can eat of the fruit of knowledge and duty and remain a recluse. The tree of life grows out of the soil of experience. Any person in a community who considers just himself and his own welfare will in time become isolated and friendless.

The essence and sweetness of life does not consist in what one shall eat and drink and wear, neither in great possessions, but upon nobleness of character, sympathy and simplicity of living. We are told that Solomon in all his glory was not arrayed like unto the lilies of the field which simply grew in the true beauty of their nature.

Let us remember that we are going this way but once, and as we pass through life illuminate our pathway with kindness and friendliness. "He who does a good deed is instantly ennobled," said Emerson, and good fellowship means doing and receiving good. Modern psychology teaches that hate can be turned into love by thinking, speaking and doing the desirable thing, so to be a good fellow one must be directed by a well-instructed conscience, endeavoring each day to do the best, cultivating thereby a better fraternal feeling and confidence for and in his fellows. One must

not do to others, not even a quack, what he would not have them do unto him. Good fellowship needs no written code of ethics, for it means doing good and avoiding evil in professional life. It calls for nobler manhood, greater knowledge, higher wisdom, sweetest kindness and loving charity, with finer and grander ideals of life. It is the divine element in man finding comfort, strength and oneness in association. It is the larger self seeking perfection through association and brotherhood. It makes us not only more considerate in our fraternal relations with our brother dentists, but it should make us more thoughtful and kinder toward our patients. Our views of life are broadened by fellowship. There is a culture which cannot be obtained by isolation.

Work is the touchstone of man's greatness. Work is not to be estimated alone for what it brings, but for what it does for a person. No man ever attained greatness in any direction without work. It is impossible for it to be otherwise. Browning says, "'Tis not what man does that exalts him, but what man would do." The person who is satisfied with present attainments cannot secure greatness, for his tasks become a burden or commonplace unless he is constantly advancing in his calling. Do better and better work each day if you would find your professional life a joy.

There is a comradeship in work that makes us better dentists because it creates in us the desire to become more worthy of the esteem of our colleagues—and they should be our colleagues in fact, that is, our associates in professional life. Good fellowship will generate in us a desire for self-culture and refinement which are much to be desired. It means that each of us is to be and do the very best we can to each and every one with whom we come in contact.

The dentist ought to be clean physically, morally and mentally, the soul of honor and the very best of fellows, for no one comes so close to people as the dentist to his patients. It obligates us to be honest and truthful in all we do for rich and poor, cultivated or uncultivated, vicious or virtuous. No matter what our patients are or do, our obligations to them are the same. There is no calling or profession where good will should prevail more than among dentists. There is seldom any reason for the dentist to come in conflict with his brother practitioner unless he is looking for trouble. In the past many of our fraternal and benevolent organizations grew out of the brotherly spirit that was fostered among men of

the same calling. That desire for spiritual kinship should be ours and it will unite us in the bond of good will and friendship. Unprofessional conduct seems to have a degrading and injurious effect on the character of those who indulge in it; so much so that as soon as competent men descend to improper advertising and other unethical conduct the more thoughtful class of people shun them, and thus they lose that aspiration and inspiration that come from good associations with the best patients and with their professional brothers. The more our patients demand of us, the greater our endeavor to rise to meet those demands. *Cheap work makes cheap dentists.* The operations to be performed should be based upon the needs of the patient. Our duty is to advise the best that can be done for each individual case; the remuneration is a secondary consideration.

Deception is a poor investment. A real quack, whether he advertises or not, is one who buys and sells his patients as a grocer does his potatoes. Dr. Edmund Noyes has well said: "There is but little use in a description with much detail of the requirements of professional morality in the treatment of other practitioners. No man can avoid transgression unless kindness and charitableness are rooted in his character and find constant illustration in his conduct. It is, of course, proper and necessary that we form an opinion of the professional ability and skill of other practitioners whose work we see or whose voices we hear in the discussion of our societies, but much care and many allowances are often necessary, or we shall hold men in lower estimation than they deserve. Experience and remembrances of our own misfortunes, misjudgments and failures are a great help, and those who have been some years in practice are usually more charitable and more just to others than the young and inexperienced men."

The good opinion of our fellow practitioners is to be more desired than that of anyone else outside of our own family and immediate friends. Let us remember it is better to love than to hate, to say a good word rather than a bad one. He who is always finding fault or harshly and unjustly criticising is writing his own character and epitaph on his countenance and soul, for no one can keep his face from revealing what he is constantly thinking and doing. To our colleagues and competitors we owe a double duty—First, the regard that every man is entitled to from every other gentleman, and, second, the professional courtesy due to a brother

practitioner. One of the great factors in life is associated effort, and its effectiveness is dependent upon good fellowship, and one of the evidences of fellowship is the power of relaxation and recreation. We ought to so order our lives and practices that we can give some of our time to the social life about us as well as to the society work of our particular avocation. Civilization means co-operation, comradeship and fellowship. The lower the order of human life the less united effort is seen. Men ceased to be savages when they learned fellowship. The dark ages became so through lack of fellowship. Men were separated through ignorance and bigotry. Our profession commenced to grow when friendship and fellowship unlocked the door of isolation, and its continued rapid growth has been largely through the cooperative efforts of society work. The wise man is he who sometimes suspects his own knowledge and methods and looks to others for something better. Go to society meetings though you have to deny yourself something else, for in that condition you can get the most out of the meetings. So from a purely selfish basis we owe it to ourselves as well as to our comrades to become more social. You see it is impossible for the unethical to assist much in the advancement of the profession, for they are the natural Ishmaelites of professional life. Their hands are against every one and every man's hands are against them.

There are international, national and state associations that have done much to enlarge the views and purposes of our profession, but there is none that has helped so much to allay ill feeling and professional jealousy and thus promote true fellowship as the local and city society. The reason is easily found—it is because they bring those who are direct competitors close together, and as men come to know each other they find they have much in common, and the only reason there may be for any unfriendly feeling is from ignorance and selfishness. It will be found that men cannot meet each other often in a social and professional way and afterwards say unfriendly things without losing self-respect, and no one is entirely lost until he loses his own self-respect. The Bard of Avon has said: "To thine own self be true, and it must follow as the night the day, thou canst not then be false to any man."

Man's history clearly shows that he who wrongs others most wrongs himself. We may always remember with profit that the vilest of men have some good points of character and the wisest and best are not at all times great and good. Let us who are try-

ing to practice according to ethical rules keep from becoming pharisaical. May we try to win rather than to drive men. Let us have a good word and an open hand rather than a scowling face and a clinched fist. Why should dentists practicing in any community hate each other? Will that make competition any less or easier? Will the cutting of prices for reasonable fees help to make the strife less? Will finding fault with those who do charge well for their operations make our lesser fees increase in number by getting them to decrease their fees in size? Let us rejoice that there are those who can command larger fees than we do, and strive honestly to be worthy of better remuneration for ourselves, *remembering we are the ones who make our practice what it is*. We will then find a clientele worthy of our highest fees.

The power of application and work are the greatest factors in one's proficiency and success. He who has these endowments is sure of both. He is more fortunate than the man of talent who lacks this power of continuous labor and concentration, for the greatest genius in life is work. The tendency of special work is to make a man narrow in thought and sympathy and to overcome that desire to read and study other things outside of our immediate specialty, and extend our sympathy beyond our individual wants.

Let us say the good words now and give our bouquets to the living. The dead cannot appreciate the words of love nor see nor smell the beauty and odor of the flowers of remembrance. How can this fraternal fellowship be fostered? By the older practitioners always giving the glad hand to the younger men as they join the profession and come into any community to live and to practice, and by the young men showing a proper regard for the older ones by calling on them as soon as they decide to locate, and in every way giving expression of good will and friendliness. The old saying that "If you would have friends you must be friendly," is true. Every man who has a proper regard for others must recognize the rights of others as equal to his own, and if we would always remember those rights, including the right to live wherever one may choose, we should then see that to be mean and ugly is to stir up strife and ill will—unmanly conduct which can end only in hatred. Only that which is good endures and only that which is of real worth succeeds in the end. Let our hopes and ideals of success be governed by generous motives, and then all that is noblest will control and the simply personal will be subservient.

Our greatest satisfaction should consist in acquiring past ideals and bringing to perfection the best thoughts within us. Fellowship is a united effort for wider culture, nobler ambitions, greater emulations and continued progress, which calls for the best in us of self-control, loyalty to the truth, the courage of our convictions, preferring to do the right thing, rather than for selfish aggrandizement, and the adjusting of oneself to other people through the habits of humility, modesty, compassion and kindness, with a desire to know the truth and the courage to live it. The most precious things money will not buy. The markets fail to quote them, yet they are the most desirable in life. Among them are good will, a clear conscience, moral excellence and conscientiousness, with friendship and good fellowship.

Discussion. *Dr. Edmund Noyes*, Chicago: There is another aspect of this subject, as good and bad fellowship are often confused. I think it is bad fellowship when a number of men line up before a bar and have a few rounds of drinks, although it is always spoken of as an act of good fellowship. We have all seen this go on for many years with apparently little harm, but as some of the men have grown older we have occasionally seen them in such a condition as to be a disgrace to themselves and a grief to their friends. Another act of bad fellowship is gambling, and we occasionally see it on the way to and from these meetings. These matters are both social rather than professional, however. A far more important thing professionally is the bad fellowship which we sometimes see exhibited in society meetings, when men criticise a paper or remarks by another man in a manner and spirit which they would not show except for the fact that he is connected with a different college from the one they are with or does not belong to the same clique. I feel free to speak of this point because of the comparative freedom from it which we have always enjoyed. I believe it is the fundamental reason for some of the most acrimonious discords which have occurred in other cities and states. Good fellowship must be founded upon honor, honesty and truthfulness. There cannot be good fellowship between the different dentists in a town if they know that they cannot depend in professional matters upon the good-will and honesty of their fellow practitioners. If the heads of dental schools have not confidence in each other's honor and sincerity, and if there isn't good fellow-

ship between them, there is danger that the competition will be for lowering instead of elevation of standard. Two illustrations of good and bad fellowship occur to me. During the absence from the city for a day of one of our members a patient came in fifteen miles from the country for treatment of a tooth, and was forced to call upon another practitioner. He treated the tooth properly, but took out a number of temporary gutta-percha fillings, which the patient's own dentist had expected to replace with gold, and put in amalgam. Such an act as this makes good fellowship an absolute impossibility. The other case was this—Dr. Black once had a patient who lived half way between St. Louis and Jacksonville. Her mouth was in bad shape and took a great deal of time and careful attention. After a few weeks' work she thought she would go to St. Louis to Dr. McKellops, and Dr. Black assured her that anything which he might do would be all right. When Dr. McKellops examined her mouth and found who had been doing the work he drove her out of his office and told her to go back to Dr. Black.

Dr. T. F. Henry, Streator: When a young man comes to town the older practitioners should extend to him the right hand of fellowship. All the dentists of Streator are on the most friendly terms, and the condition is largely due to Dr. Taylor, for he has always called upon each new practitioner and made the rest of us do the same.

Dr. G. D. Sitherwood, Bloomington: The average young dentist looks upon the state dental society as "all good fellowship, clinic and \$5," so the older practitioners must enlighten them upon this point and show them how much good they can derive from attending each meeting of the state society. The older dentists in a town should welcome the newcomer, and, on the other hand, he should call upon his fellows so soon as he arrives.

Dr. Grafton Munroe, Springfield: This city has a flourishing local society and there is the best of good feeling existing among the practitioners here.

Dr. G. H. Henderson, Springfield: I might add that we have had as many as sixteen dentists at our local meeting this last year, although it has been stated that you could not get two dentists here together in one room. What the profession needs is more of a spirit of brotherly love and less of that of criticism.

Dr. A. M. Harrison, Rockford: We have a local society of

sixteen members, and not only do the meetings benefit us professionally, but good fellowship has been developed to the highest point. I have never seen better feeling among the dentists of a town than exists in Rockford.

Dr. Taylor, closing discussion: Good fellowship may not be so pertinent to a meeting of this kind as some other things, yet this society would never have attained its present greatness if it had not been for the good fellowship of the early members. It was the fraternal spirit in them that has made the fine harmony among us and opened the way for the scientific work of this body.

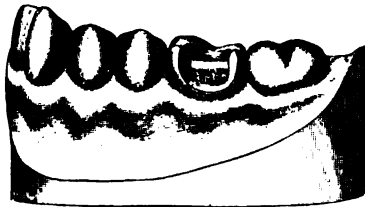
PAINLESS DENTISTRY AND WALL STREET FAKES.—The gullibility of the public is incomprehensible. We have all read the advertisements of "painless dentistry," and these signs attract patrons when all other inducements fail. Yet everybody knows that there is no such thing as "painless" dentistry, and no dentist will claim that there is, no matter what his advertisements might say. If he gets you into his chair and you complain of the pain, he will not deny that he is hurting you, but will comfort you by the assurance that if you had gone to someone else you would have suffered more. It would seem as if no one would be fooled by the signs of these "painless" dentists, but the rate at which they multiply shows that they are good catchers of business. So it is in Wall street. Sharpers and tricksters are constantly sending out alluring invitations to the public to give up their money, in return for extraordinary and absolutely impossible profits. One after the other these swindling syndicates are exposed and go to the wall, leaving their deluded subscribers to suffer. But a new crop of fools seems to be born every day. The fakirs change their names and places of business, but keep their bank accounts well replenished.—*Jasper in Leslie's Weekly*.

ARGONIN.—Argonin occurs as a white powder soluble in warm water, the solutions having a slight opalescent appearance. It results from the action of silver upon sodium casein; is not precipitated by chlorin solutions, alkalies or albumin. It has decided germicidal, antiseptic and deodorant properties, and is destructive to all forms of bacterial life. Solutions of argonin are best made as follows: The powder should be first thoroughly moistened with cold distilled water; then the remaining water necessary to make the desired percentage solution added, and the whole placed in a water bath at 212°, with constant stirring with a glass rod until a perfect solution is obtained, being careful not to use too great a heat and to make the solution only in porcelain or glass. The solutions should then be transferred to colored glass bottles and kept in a cool place tightly corked and from the light. Solutions may be from five to ten per cent. Fifteen grains of argonin contain as much silver as one grain of silver nitrate. It may be employed in arresting decay instead of silver nitrate, and does not discolor the surfaces of the teeth. In fistulous abscess a five per cent solution is efficacious, as is also the case in empyema of the antrum and in pyorrhea alveolaris.—*Therapeutic Progress*.

Digests.

INLAYS—PORCELAIN AND GOLD. By H. B. Tileston, D.D.S., Louisville, Ky. Read before the Alabama State Dental Association, May 15, 1902. So many excellent articles on porcelain have already appeared in print that I will take up the consideration of only a few points in porcelain work which deserve at least a passing mention, and will then give a detailed description of a method of making gold inlays which is unique, definite and satisfactory as to results. The question of high or low-fusing bodies was for a long time a mooted one, but the decision is now practically unanimous in favor of the former. I tried the low-fusing bodies faithfully for several years with results so unsatisfactory that I finally abandoned porcelain inlay work altogether for a time. The chief objections were the extreme friability of the material and the fact that colors which matched the tooth nicely at first would fade

FIG. 1.



Showing preparation of cavity in second molar.

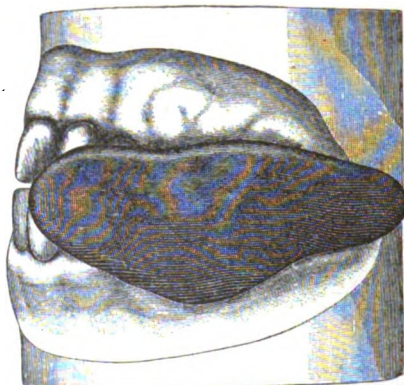
out and soon become unsightly. There was also a decided tendency in the material to become porous in the baking, with the result that the surface of the inlay would after a time be covered with minute black specks. Even the high-fusing bodies are not entirely free from these faults, but the later product of the manufacturers, together with improved methods and appliances, particularly the electric furnace, make it possible with great care and skill to obtain results eminently satisfactory.

The use of high-fusing bodies of course necessitates the employment of platinum in forming the matrix. Platinum is not so difficult to manipulate if a perfectly pure article can be obtained, not thicker than one one-thousandth of an inch, and it be annealed properly. It is objected that in cavities having complicated curves the difficulties in the way of getting a perfect matrix with platinum are

insurmountable. The remedy is obviously to eliminate complicated curves and reduce to simple ones by heroically cutting away tooth-tissue, thus changing an unfavorable case to a favorable one. A perfectly successful inlay will be one which under ordinary conditions of observation will be practically invisible; hence a little sacrifice of more or less tooth substance is not a matter of much importance.

I have experimented with the method of taking an impression of the cavity, using cement for the purpose, and from this striking up a matrix, using the impression as a die; or casting cement or fusible metal over the impression and burnishing the platinum into

FIG. 2.



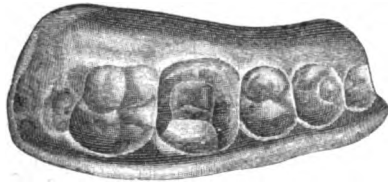
Modeling compound impression and bite in position.

the replica of the cavity thus obtained instead of into the cavity itself; but like the majority of operators I have returned to the former method of burnishing the matrix directly into the cavity in the tooth. The only value attaching to the impression method is to be able to make an approximately perfect matrix which is to be corrected afterward in the cavity itself; but the advantage thus gained is in most instances not worth the additional time required. A modification of the impression method may be profitably employed by taking an impression of the cavity with the matrix in it as follows: After the platinum has been perfectly burnished into the cavity and accurately over the margins, a bit of modeling compound is warmed and pressed into the matrix and out over the margins, forcing the platinum tightly into contact with the cavity walls and margins, where it is held by the finger until cold, when matrix and

impression may be removed together, thus avoiding all danger of distortion. It is then invested with a material calculated to withstand the heat of the furnace, after turning up several corners of the platinum that they may become engaged with the investment. After warming and removing the modeling compound we have not only the platinum-lined cavity exactly as it was in the tooth, but a part of the surrounding surfaces of the tooth as well, which affords a definite guide in restoring contours. An invested matrix can be handled without danger of being bent, and is not likely to be warped in baking. It is excellent practice to bake some high-fusing foundation body in the bottom of the matrix, return to the tooth and correct the margins, then take an impression as described, and invest. This adds another element of certainty in getting a perfect-fitting inlay.

In building out contours it is best to add an excess of body and

FIG. 3.



Modeling compound removed, showing cavity in tooth to be filled with amalgam.

then carve accurately to the desired form, providing a slight excess for shrinkage, rather than to bake on an excess of material with the expectation of grinding down after the inlay is set, as this endangers the friable margins, which are very liable to be chipped and thus ruin what might at first have been a perfect fit. Dr. Capon says it is best to have the porcelain edge slightly below the enamel margin rather than above it, and then to polish the enamel down flush instead of the porcelain. The injunction so constantly insisted upon, to have the enamel margins square and not beveled, cannot be disregarded with impunity if success is to be hoped for. Attenuated edges of porcelain will not stand anywhere, especially when exposed to stress.

It has been frequently stated that the simplest and easiest cases in which to obtain both accuracy of fit and perfection of shade are those which occur upon labial surfaces. My own experience does not accord with this statement. I have found that in both

particulars satisfactory results are more readily obtained in approximal cavities and in incisal corner restorations than upon labial surfaces. With surrounding walls cut square and perpendicular, as they should be, an inlay made for a labial cavity will fail to fit by just the thickness of the platinum used for the matrix; and a color which is entirely satisfactory when the inlay is tried in, because the basal color of the tooth is seen through the translucent porcelain, may be found to be wholly unsatisfactory when underlaid by the opaque cement used in setting. In cases of approximal cavities and restoration of incisal corners or tips, when the matrix has been stripped off, the inlay sets back snugly against the enamel margin and the joint is eliminated entirely. The shade in such cases, once accurately obtained, looks the same after it has been set as it did before. The color in approximal cases should always be a shade or two lighter than the natural color of the tooth.

Just how to obtain colors in an inlay which exactly match the

FIG. 4



Partial model, showing tooth and cavity of amalgam.

case in hand has been the subject of considerable discussion of late. Some claim that the best results are secured by mixing or blending the shades and then baking them together, while others, notably Dr. Reeves of Chicago, maintain that it is best to lay on the colors separately and by repeated firings get the desired blend through the translucency of the material, the deeper basal shades being modified by being seen through the overlying ones. While this latter method of procedure would no doubt produce very happy results when skillfully done, the nice discrimination necessary for its successful employment is quite beyond the capabilities of most operators. The shade problem is an exceedingly vexing one, especially to the beginner, and its only solution really lies in long practice. Not only must the colors be skillfully selected to suit any particular case, but great care is requisite in the firing, that the delicate shades may be fully developed by just the right amount of heat and time given in the firing, on the one hand, and that the heat be not so excessive as to burn out the colors, on the other. Some of the shades in porcelain

bodies, notably the yellows, burn out readily. Hence it is important for the operator to familiarize himself with the material he is using and how it is affected by the apparatus he may be employing for baking, by experimenting before undertaking a practical case.

In the early days of porcelain work there was much uneasiness expressed as to the durability of the cement attachment of the inlay to the cavity walls, it being stated frequently that the method of setting inlays with oxyphosphate of zinc cement constituted the chief element of weakness in the process. Experience proves such fears to have been groundless. Not only does the cement hold the porcelain in place, but there seems to be very little tendency for the material to dissolve out from the joints. Even the joint at the gum margin, where cement fillings are most prone to fail, appears to be as secure as at any other point. All this, of course, where the

FIG. 5.



Gold matrix, showing hole punched in back.

FIG. 7.



Complete gold inlay.

fitting of the inlay is accurate and where favorable conditions as to dryness have been maintained.

Where there is sufficient material to admit of it the inlay should be grooved and the cavity slightly undercut to afford greater security of attachment for the cement, but upon surfaces not exposed to stress such provision is hardly necessary, especially if a sticky or adhesive cement be used. In incisal corner restorations much more definite anchorage must be provided. The best method in such cases is that suggested and demonstrated by Dr. Capon, of baking a platinum wire into the inlay, to be anchored by a gold filling upon the lingual or incisal surface of the tooth.

Carried away by their enthusiasm, some operators in porcelain make use of it in cases where something else would do better. Small and medium-sized cavities in bicuspid and molars on occlusal or approximal surfaces can be more quickly filled with gold and saved more certainly than with porcelain, because the demands in the manipulation of the latter material cannot always be complied with in these localities, and because porcelain will not bear the force of mastication which normally falls upon these teeth. In

cases of larger cavities, which if restored to contour with gold would require long and tedious operations, or which would perhaps more frequently be restored with amalgam, or in which in many cases crowning would be resorted to, the gold inlay which I am about to describe is peculiarly adaptable.

In preparing a cavity in molar or bicuspid to receive a gold inlay all overhanging walls must be cut boldly away, and all undercuts eliminated with chisels where possible, or filled in with cement where it seems best not to further cut away a wall; the object being to so shape the cavity that an approximately perfect impression of it may be taken. (Fig. 1.) Where large approximal or buccal contours are to be made anchorage must be provided in a step upon the occlusal surface. In some cases the inlay may extend from a mesial to a distal cavity over the occlusal surface. These

FIG. 6.



Gold matrix and contour piece assembled in place in an approximal cavity, with cotton packed between them to produce the desired contour.

latter are the most difficult of all cases, but can be successfully accomplished by this method. All margins should be smooth, and they may be made either square or beveled. In most instances they had better be beveled, especially where a weak enamel wall needs to be supported by the overlapping of the gold edge of the inlay.

The case is now ready for the impression, which, with the bite, is taken as follows: Warm a small piece of modeling compound over your Bunsen burner or lamp at the chair; pinch up a bit of it upon one side in the form of a teat to enter the cavity in advance of the mass so as to certainly fill it all; place in position over the teeth, without drying them at all, pressing down or up as the case may be enough to start it right, and instruct the patient to close the jaws tightly. Now with the finger press the compound over the buccal surfaces and into the embrasures, requesting the patient to do the same on the inside with the tongue, and with the jaws still tightly held together, drop the saliva ejector into the pocket of the

cheek and chill the compound thoroughly with a jet of cold water. (Fig. 2.) It is then carefully removed, the cavity in the tooth filled with temporary stopping and the patient dismissed.

That part of the impression representing the cavity and the entire tooth involved is now packed with copper amalgam (Fig. 3), the balance filled with plaster and mounted on a small crown articulator. In packing in the amalgam a small button should be built up on the base of the tooth to engage with the plaster of the model, so that the metal tooth shall be held strongly in position in the model. The compound being removed, we now have a perfect model of a section of the jaws in occlusion, with the tooth and its cavity made in copper amalgam, upon which we may prepare our gold inlay almost to the point of completion. (Fig. 4.) In some instances the model of the cavity may be slightly imperfect, but gold, unlike porcelain, is tractable and can be modified and corrected in the cavity itself, which is provided for farther along in the process.

Pure gold plate about 36 or 38 gauge is employed in making an inlay shell, which is afterward thickened and strengthened by being partly filled with 20-karat gold or 20-karat solder. Pure gold plate, as thin as 36 gauge or thinner, works very soft and can readily be adapted to all parts of the copper replica of the cavity with burnishers assisted at first by a pledget of wet cotton to avoid puncturing the gold while carrying it into the deeper parts. The gold should be so trimmed as to leave it overlapping the margins everywhere. If the impression is a good one and is carefully packed with the amalgam, a distinct line will be seen on the model indicating the gingival margin of the cavity, and this must be carefully brought out in the gold matrix and a little overlap of gold provided along this margin as well as the others. A hole one-sixteenth to one-eighth inch in diameter is now punched in the gold at that part which covers the axial floor of the cavity. (Fig. 5.)

The next step, the arrangement of the outer piece of gold and the formation of the contour, appears at first sight to be quite difficult, but in most cases it is very simple. In approximal or buccal cavities, with an occlusal step, where the restoration required is not excessive, the result is accomplished readily in the following manner: A piece of the same thickness of pure gold is cut large enough to extend well out into the embrasures, buccal and lingual, and to reach over upon the occlusal as far as will be needed. This is

trimmed along one edge to fit within the line on the matrix piece which marks the gingival margin, but is not allowed to lap over upon the excess left along that margin. The two pieces are now held together with a pair of long, slender solder tweezers and tacked with a tiny piece of 22-karat gold. The pieces thus assembled are dropped back into the copper cavity, when the outer piece will extend straight out into the embrasures and stand up above the occlusal surface of the tooth. Wet cotton is now packed between the two pieces and the gold forced out into the desired contact with the approximating tooth (Fig. 6), when the gold is bent over the cotton and down upon the occlusal surface, and the articulator closed tightly, forcing the thin gold into proper articulating form. Holding the articulator firmly closed, the gold is bent down along the buccal and lingual margins into contact with the matrix piece with a flat burnisher, the cotton being tucked in where it is in the way. At the bucco and linguo-occlusal angles the outer piece may have to be cut a little to properly shape those corners. The outer piece is now trimmed all around so that its margin falls within the excess provided in the matrix piece, and should lie as nearly as possible along the true margin of the cavity. This arrangement makes the placing of the solder easier and provides an overlap of thin pure gold for final burnishing and finish after the inlay is set.

The cotton is now removed either by turning up the occlusal piece or by pulling it out through the hole in the back, and nothing more is done until the patient appears for the second sitting, when it is tried in the tooth and corrected and perfected both as to its accuracy of fit and its occlusion. In most cases it is surprising how nearly perfect both have been made on the model, but it is well always to provide for this final adjusting, when the inlay may be finished and set at the same sitting.

When all desired corrections have been made the edges are soldered together with 22-karat gold and the interior filled almost but not quite full with 20-karat solder by dropping small pieces through the hole in the back and fusing them by holding in the flame of a Bunsen burner or spirit lamp. A cavity should be left just within and about the hole for the cement to enter and help hold the inlay tightly to place in the cavity. The inlay should be set under conditions of perfect dryness, the rubber dam being used wherever possible, and after cement has thoroughly set should be finished like a gold filling. The rougher finishing and the thinning

of the edges should be done with the ordinary gold files before setting, and while the cement is still soft the thin edges should be carefully burnished over the enamel margins all around the cavity, thus leaving practically no cement at all exposed to washing. (Fig. 7.)

In cases demanding excessive restoration of contour, where the method with cotton is not applicable, the desired contour may be built out and carved with wax or plaster from which a die and counterdie are made and the outer piece struck up. Or a quicker way and one giving about as good results is to carve up the contour in plaster poured into the matrix piece, press this into warmed sealing-wax, and then burnish a piece of gold into the intaglio die thus obtained and correct on the model with burnishers and pliers.

I am frequently asked why I use copper amalgam in making the tooth-model. My answer is that any good amalgam will do, or even cement might be used, but for several reasons the copper amalgam serves the purpose best. It sets quickly, neither expands nor contracts, has good edge strength, its initial cost is small, and it can be used over and over again. Where thin enamel walls are to be represented the cement would not be strong enough to withstand the force necessary in adapting the gold to the cavity.

The greater the amount of restoration demanded in a given case up to the point of necessary crowning, the better is this method adapted to its needs, and frequently teeth that would ordinarily be crowned can be much more comfortably and hygienically treated by this means. Moreover, I firmly believe, and the belief is founded upon observation, that a well-fitted inlay cemented in will save the tooth for a longer time than would a filling which would be pronounced to be a good one. In the practice of this method of making gold inlays I have undertaken a great variety of cases upon buccal and approximal surfaces, in localities in the mouth difficult as well as easy of access, and some involving both mesial and distal surfaces of molars and bicuspids; and I confidently offer it as a practical, esthetic and successful means of restoration and conservation in all such cases.—*Cosmos, August, 1902.*

ADENOIDS IN RELATION TO STRUCTURAL CHANGES. By F. Park Lewis, M.D., Buffalo. Read before the New York Institute of Stomatology, February 12, 1902. By adenoids we understand a hypertrophied condition of the lymphoid tissues, normally found in the vault of the pharynx, posterior to

the nasal openings. In structure these tissues form a portion of what is known as the tonsillar ring, composed of the faucial tonsils on either side, the lingual tonsils, consisting of a number of enlargements at the base of the tongue, and the pharyngeal tonsil in the vault of the pharynx. In a normal condition this last, the pharyngeal, or as it is sometimes called, Luschka's tonsil, consists of a number of closed lymph-follicles in the mucous membrane, surrounded by loose-meshed connective tissue. There is a soft variety of what are still called adenoids, which is predominantly an enlargement of this mucous tissue; when the connective tissue is in excess it is quite another thing. It has been deplored that either should be called adenoids, for not even the latter, or true adenoid, is a hypertrophy of the lymph-gland. Practically, it might almost as well be, however, for the contraction and hardening of the surrounding tissue cuts off the lymph flow as completely as if it were the lymph-vessels themselves that were affected. It must be remembered that the lymphatic tract is the channel through which the nutritive elements of the blood are carried to their destination. The lymph in the human body is its life. It is the food of the cell, and upon its free flow is dependent the functional activity and the normal development of every tissue.

The lymphatic glands in the vault of the pharynx are part of a chain extending through the openings of the skull, carrying nutrition directly to the brain itself. Immediately above this region is the sella turcica, which contains the pituitary body. Those of you who have been following modern medical research will remember that in the strange and interesting condition called acromegalia or gigantism, in which abnormal enlargement of the whole bony structure occurs, post-mortem investigations have discovered an enlargement of this pituitary body as a most constant feature.

The pituitary body is composed of two lobes, one of which is true brain tissue and the other a lymphatic gland. The chain is continuous from the lymphoid tissue in the vault of the pharynx, by way of the arterial seats, to the substance of this gland itself. Now, when we realize how profound is the disturbance of nutrition throughout the entire system when the functions of the pituitary body are disturbed, it may be readily understood that any obstruction to the free flow of lymph through glands so nearly adjacent as those of the pharynx might seriously interfere in other ways with the processes of development.

A disturbance of function always precedes a change of structure; and if it can be shown that functional disturbances are produced in adjacent organs by hypertrophies of the lymphoid tissues in the pharynx and the post-nasal space, the conclusion is justified that structural changes must follow in case the hypertrophies are allowed to continue. Should these hypertrophies occur during the period of development in children, we are warranted in making the tentative deduction that where functional disturbances have been observed, interferences with development are likely to occur, as structural changes would in an adult.

Now, clinically the relationship between adenoids and deformities of the face, nose and chest has been so constantly observed that the facial appearance has come to be accepted as a characteristic indication of the presence of adenoid vegetations in the nasopharynx. Their relationship to some forms of ear disease, while often recognized, has not yet received the attention which its importance demands, while the connection of hypertrophies of this nature with the eye, and its development, has received scarcely any consideration whatsoever. Indeed, I cannot find that this aspect of the subject has been studied at all.

The typical adenoid face is well known. The enlargement of tissue obstructing the posterior nares so narrows the caliber of these openings that breathing is possible only with the mouth partially open. The upper lip is commonly shortened, the lower lip droops. This not only gives a stupid expression to the face, but the mental processes are actually slow. The child finds difficulty in concentrating the attention on any subject, and reflex symptoms of the most varied character are not uncommon. (Among these may be mentioned the night terrors from which children suffer, wetting the bed, persistent headaches not relieved by ordinary measures, marked catarrhal symptoms, etc.)

The form of skull which is found so commonly in cases of this character is that in which the upper jaw—sometimes, indeed, the lower as well—is narrowed laterally. The face is compressed from side to side, the *bony palate* forms a high arch. The teeth are so crowded that they find no room for regular eruption, and to the unpleasant rat-shaped face is therefore added the disfigurement of an ill-shaped mouth with irregular teeth. The high arch constituting the bones of the roof of the mouth presses up the septum of the nose, causing it to deviate, and laying the foundation

for future obstructions in the nostril. In a word, the mechanical fact of crowding the face together throws all the bony structures out of their true relationships, and is the foundation of disturbances of a most serious character.

Much thought has been given to the manner in which this peculiar conformation occurs, and the conclusion seems to be that the obstruction of the nose by the adenoids, necessitating mouth-breathing, has gradually drawn up the as yet plastic structure of the roof of the mouth, until this conformation has resulted. That this is not a complete explanation, although it may be a contributing element, is shown by two facts: first, that the condition is sometimes present at so early an age that it could not have been produced by suction, as this process would necessitate time, and the condition must have been congenital; and, second, because it has been exhibited in branches of families to such an extent that the element of heredity must enter largely into it. [That congenital adenoids are not infrequent is shown by Leopold Chaureau, who reports having made fifty operations on new-born infants.]

A case that came under my observation recently was that of twin children, in one of whom this facial distortion was conspicuous, while in the other the face was broad and the jaws roomy. The first child was a mouth-breather from birth. The mother assured me that this child was the elder, and had been carried low in the pelvis, leading to the possible inference that the weight of the other child by continued pressure might have changed the shape of the skull. The facial conformation characteristic of this condition frequently is found in a mother and her whole family of children. It would be interesting to know whether a narrow pelvis might not sometimes be instrumental in producing the narrow head, which is the foundation of the whole condition.

But while all this affords a fascinating field for speculation and theory, it is not essential that we should know *how* it is produced, it is sufficient to realize that a condition which will so crowd the jaws that the teeth have not sufficient room for their eruption, may also so impinge upon the lymph-channels as to produce strangulation of these structures, with subsequent hypernutrition and the abnormal development of connective tissues, which we call adenoids. Therefore, although the consensus of opinion seems to be that suctional breathing, the result of adenoids, has been the cause of the narrowed face and head, with all the attendant symp-

toms which we have been considering, I cannot but believe it more probably that the reverse is the fact—that the narrow head and face, having been produced by any means whatsoever, would naturally result in obstruction of lymph-passages, with all the varied and unfortunate phenomena which such obstruction implies. (I should say in parentheses that the narrow face with its attendant obstructions is not the only thing that could crowd upon the delicate developing tissues until adenoid growths result, but cases where abnormalities of the face are not present would be the concern of the general physician, not of the dental surgeon, and therefore will not be considered in this paper.)

If my theory is correct its importance to the dental profession is obvious. By an early expansion of the jaw not only is the unpleasant rat-mouth molded into better form and the teeth given room to develop properly, the bony arch lowered and the lips thus brought into place, the nasal septum straightened and the features given a dignity and the mouth an efficiency that they would otherwise lack, but the lymph-channels are unstopped. The first of these are chiefly mechanical results, the latter is concerned with the essential elements of structural nutrition. The different organs that may be affected when nutrition is interfered with, and the various ways in which deviations from the normal occur, interest chiefly, of course, the general physician. But the whole subject, even pushed to somewhat wearisome detail, is of importance to the dental surgeon, as it urges upon him the necessity of recognizing the less striking of these cases. Then, when recognized in instances where the facial deformities are not extreme or but slightly apparent, there is sometimes difficulty in persuading the parents to submit their children to the measures necessary to produce orthodontia. The process is a long and expensive one and entails not a little discomfort, and the parent is likely to urge postponement, hoping that the necessity for the operation may disappear with growth. A knowledge of the remote and serious difficulties which may be the outcome of this condition will afford the surgeon in the several details so many weapons for the defense of his position.

One of the most obvious effects of adenoid obstructions in the vault of the pharynx is the mechanical interference with the ventilation of the middle ear through the Eustachian tubes. According to the location of the adenoid growths, either one or both sides may be involved. The necessity of an unimpeded passage through

the nose, as related to the ear, may be immediately demonstrated in a normal condition by the simple experiment of closing the nostrils. This may be made more clear by at the same time trying to swallow. We find this same process emphasized by a common cold in the head, which gives the sensation known as a stuffy feeling in the head and ears. Now, with enlarged tissues in the throat it requires a very slight inflammation to so interfere with the mouths of the Eustachian tubes as to almost completely shut off the entrance of air. The continuity of tissue readily allows an extension of the inflammation to the middle ear; the drum membrane also becomes inflamed. The swollen tissues of the tympanus ultimately fill with pus, and the pain is excruciating until the membrane is ruptured or an opening artificially made by the surgeon's knife, and we have all the classic symptoms of otitis, with the possible resultant conditions of a chronic otorrhea, mastoid involvement, cerebral abscess, sinus thrombosis, or even general septicemia. [A. Plotier found twenty cases of adenoids in thirty-eight cases of death from diphtheria.]

I think it rarely happens, when children have repeated attacks of earache, that investigation will not show the presence of adenoids. The continued obstruction of the Eustachian tubes without inflammatory complications develops a progressive form of catarrhal deafness, for which no relief can be obtained so long as the obstructions continue. This is a kind of chronic deafness, the origin of which is frequently overlooked. In the course of time organic changes occur in the structures of the middle ear, such as retraction and thickening of the drum membrane, adhesions at the joints of the ossiculæ, and in some cases involvement of the nervous structures of the inner ear itself, with permanent narrowing of the Eustachian tube. It is, of course, then too late for the removal of the cause to produce beneficial results. With a knowledge of these facts it is obvious that no case of deafness in a child should ever be allowed to continue without a thorough examination of the throat to determine whether obstructions are present or not.

The large number of deaf mutes in whom adenoid vegetations are found to exist would seem to justify the conclusion that these obstructions are either congenital or prenatal, and that deafness being present at so early a period allows the unused ear structures to degenerate, while the brain centers for audition remain unde-

veloped. The remarkable experiments of Urbanschitsch in the training of mutes with ear-trumpets would indicate that in many of these cases some degree of hearing might be secured by training the ear, if the auditory passages were free from obstructions.

Of course, it is only before structural changes have taken place that beneficial results may be anticipated. Structural changes take place in a comparatively short time when, added to disuse, we have a choking of the channels of nutrition. The presence of adenoids in the throat may therefore be responsible for structural changes in the ear, and not many years be required in the process. This makes evident the necessity for careful diagnosis and prompt care of young children when these conditions may exist.

It is an accepted idea that adenoids left to themselves will atrophy at adolescence, but this is only partially true. The growth may and probably does shrink somewhat, but when connective tissue changes have once occurred the adenoid persists, although the enlargement of the vault of the pharynx coincident with normal growth lifts the enlarged tissue so that it no longer obviously obstructs the nares, and while it may be producing disastrous changes its presence is often totally unsuspected. I have removed large adenoids from a man thirty-five years of age, very greatly relieving his deafness in one ear, but in the other tissue changes had occurred to such a degree that improvement of hearing was impossible. It is the persistence of these unrecognized progressive tissue changes that lays the foundation for much of the incurable deafness of adult life. And when these are the result of abnormal growths, which may in turn be the result of abnormal mouth development, not only must the growths be removed, but the care of the jaws and teeth must not be too long postponed.

Now, I have reason to believe that the obstruction of the flow of lymph carrying nutrient elements to the ear has possibly as much to do with the results as the mechanical obstruction in shutting off the Eustachian tubes. But upon this subject the final word has by no means yet been said.

When we speak of the eye the dental relationship would seem to be less apparent, but as a matter of fact we find here similar conditions, giving rise to equally marked results, and if my theory is correct, that distorted facial development produces adenoidal growths, and that adenoids are responsible for various eye troubles not hitherto traceable to any direct cause, the relationship is dis-

covered to be intimate. If, as was shown in regard to the ear, functional difficulties arise in conjunction with adenoids and disappear on their removal, and we remember that structural changes invariably follow a persistent aberration of function, we may say that here, too, similar conclusions follow like premises. That is to say, structural changes in the eye may occur as the result of lymphoid hypertrophies. Furthermore, if these obstructions to normal nutrition occur during the plastic period before development is complete, they may interfere with the normal growth of the organ, and arrested development be the result.

No one, two or three cases would be sufficient to prove the relationships of adenoids to disturbances of the eyes, but when over and over again cases that have evaded all ordinary medical or surgical measures have been immediately relieved by the removal of lymphoid growths, the causative relationship would seem to be demonstrated. One of the commonest conditions which I have observed in this connection is that in which the conjunctiva is congested, the eyes weak and suffused, a condition for which local measures have proved in many instances totally insufficient, but which was at once relieved by the discovery and removal of adenoids. [Coppez and Snellen have both recorded frequent instances in which follicular conjunctivitis was associated with post-nasal adenoids.]

A peculiarly interesting case came under my observation recently of a child having a persistent overflow of tears from one eye. The lachrymal duct was found perfectly normal, and the overflow, which had for several years resisted treatment, ceased within a week after removal of a small mass of adenoids that had been too slight to occasion the child any other discomfort. Various weaknesses of the ocular muscles, for which suitable glasses and even operative measures have been unavailing, have regained their normal balance after the nasopharynx has been cleared. Lauren's case, in which strabismus disappeared after an operation for adenoids, and Miles' cases of esthenopia, which subsided after similar operations, lead directly, as do all of these cases, to a consideration of the development of the eye and the causes which may modify it. [Thomas cites a case of a child of ten with divergent strabismus and mental disturbances following meningitis during infancy. After curettage of the nasal pharynx for adenoids the strabismus entirely disappeared.]

At birth the eye of a child is in the same undeveloped condi-

tions as are the other organs. As the child grows the eye develops, enlarges and becomes functionally able to do the work which is required of it. This process of development extends normally through the growing period of the child's life. If for any reason it should be interrupted the eye remains throughout life that of the child. It is then too flat, never having reached a full contour, and is called a hypermetropic or over-sighted eye. Such eyes are peculiarly prone to convergence, and are apt to be dull-sighted. A laryngologist by the name of Ziem has recently made some very interesting experiments that are most suggestive in this connection. He sewed up the nostrils of young rabbits, and found that on the side from which air was excluded the eye remained in a permanently undeveloped condition. In other words, it remained a flat or hypermetropic eye, while that on the opposite side reached its normal development. In my own experience such a large number of these hypermetropic and squinting eyes in children perhaps twelve years of age have been found in connection with lymphoid hypertrophies that it is impossible to believe the association accidental.

If it be true that the nutritive functions of the head are so profoundly impaired by nasopharyngeal hypertrophies, and if it be also true that these are again contingent upon corrigible deformities of the skull, I can only say again, if possible with still more emphasis, that as the responsibility in this class of cases often falls upon the dental profession long before any developments occur which would bring them to the care of the general surgeon, the entire subject must be regarded as of an importance which can hardly be exaggerated.—*International*.

OCCLUSAL ANCHORAGES FOR FILLINGS PLACED IN THE MESIO OR DISTO-OCCLUSAL SURFACES OF BICUSPIDS AND MOLARS. By W. H. K. Moyer, D.D.S., Little Falls, Minn. Read at the annual clinic of the G. V. Black Dental Club, February 20, 1902. For so-called proximo-occlusal fillings in bicuspid and molars, where the material to be used depends on the shape of the cavity for support, there are but two general methods of anchoring—one by means of pits or grooves in the lingual and buccal walls, the other by means of a step cut in the occlusal surface at right angles to the main wall of the cavity. In comparing these

methods we must consider the advantages and disadvantages of each, taking into careful consideration the tests which such fillings must withstand.

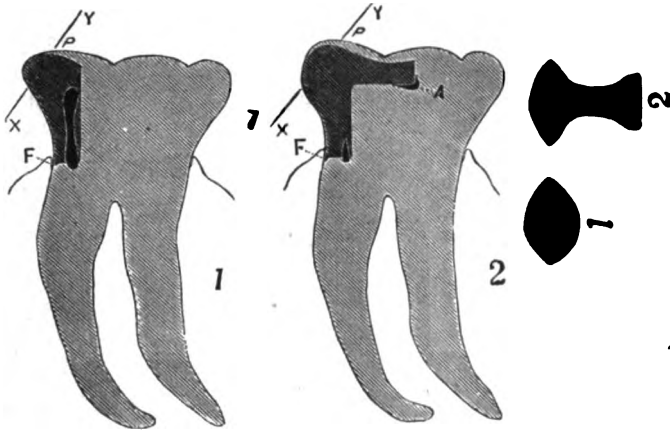
The adult human can exert a crushing force of from 100 to 300 pounds on the posterior teeth. This is measured by means of a machine known as a gnathodynamometer. The machine gripped in an ordinarily strong hand can be made to register barely 50 pounds, so we get some idea of the pressure exerted on the teeth. This force, by the intervention of some hard substance such as a shot or piece of bone in the food, may be brought almost entirely upon one filling, therefore is an accurate gauge of the amount of stress which a filling must be able to withstand.

In the drawings before you sections of teeth with samples of fillings anchored by these different methods are shown, also the direction of the line of force which is most apt to dislodge them. In Fig. 1 is a representation of what I shall term lateral anchorage. The grooves are started at the linguo-gingivo-axial and bucco-gingivo-axial angles and extend occlusally to the dento-enamel junction, or roughly speaking, two-thirds of the entire depth of the cavity. Beyond this point we would be depending for support on enamel, a substance unworthy of consideration for anchorage purposes. Fig. 2 represents an occlusal anchorage. Two slight grooves at the linguo-gingivo-axial and bucco-gingivo-axial angles extending very slightly toward the occlusal, then a right-angle step at the occlusal running back into the middle third of the occlusal surface and slightly dovetailed in form. This occlusal step is cut just through the enamel, so that the filling rests on the resilient dentin and is secured by slight grooves in the dentin at point (a).

The preparation of the two cavities, aside from the anchorage, is supposed to be identical. With the lateral anchorage what have we done to the tooth? We have weakened it at a vital point where our fillings are prone to fail. We have cut nearly if not quite through the dentin of the lateral walls, leaving little but friable enamel for support, and at the occlusal third have no anchorage at all. With the occlusal anchorage we have weakened the tooth at no essential point—in fact, have strengthened it by cutting out and filling the fissure, which in a large proportion of cases is a danger point. The filling is anchored entirely in dentin and rests securely on two flat seats of dentin, so that the slightest anchorage suffices. By means of the step anchorage and dovetail it is so secured that

to move it a fracture of an entire lingual or buccal cusp is necessary.

Let us examine the strain the anchorage points are subjected to by using different lines of force. A force exerted at right angles to the occlusal surface at this point forces each filling against the seat, therefore is in no way dangerous. But as we incline the line of force in Fig. 1 the tendency is to push the filling away from the cavity walls, with nothing but the lateral anchorage to hold it in place, so the strength of the lateral walls or of the filling material in the anchorage grooves is a gauge of the amount of stress the filling can withstand. In Fig. 2 the filling is forced more tightly against



the floor of the step of dentin and cannot be moved except by a fracture of the filling at the angle of the step. When the force is exerted at P at right angles neither filling is endangered, but if inclined a few degrees the tendency in both cases is to tip the filling out of the cavity. In Fig. 1 the strain comes directly on the lingual and buccal walls at the point where we have previously weakened them and frequently results in a fracture of one or both. In Fig. 2 the strain comes on the whole pillars of the cusps, the strongest parts of the teeth, for to move the filling in the step it must bear directly against these cusps.

Another comparison which brings into consideration one of the most powerful factors known in mechanics. That is the lever. The law of levers, which you are all familiar with, is: The power is to the weight as the power arm is to the weight arm. This means that the power multiplied by the length of the power arm is equal

to the weight multiplied by the length of weight arm. The fulcrum is the stationary or supported point of the lever. In each of the illustrations a force exerted at point (P) at this angle would tend to tip the filling out of the cavity with the cavo-enamel margin at F as the point of least movement. It would convert the fillings into levers with point F as the fulcrum. The weight to be moved would be the amount of resistance the anchorage points would offer (W). The power arm would be the distance from F to P, which is the same in both cases. The distance from F to the anchorage points would represent the weight arm. In Fig. 1, measuring from F to the highest point of the anchorage possible in the dentin (and this is assuming that all the anchorage strength is at that point), we find the distance in this case to be four inches. In Fig. 2, by describing an arc with F as a center from point P, we find that the weight arm is the same length as the power arm. We will assume that there is an occlusal force of 200 pounds exerted at P along this line of force. In Fig. 1 we have this example: The weight or resistance is the unknown quantity or (X). Fig. 1—(X) times 4 = 200×4 . $4X = 1,200$. $X = 300$ pounds. Fig. 2—X times 6 = 200×6 . $6X = 1,200$. $X = 200$ pounds.

This means that a force of 200 pounds in Fig. 1 would exert a strain on the anchorage grooves of 300 pounds, while in Fig. 2 the same force in the same place on the filling would exert a force of only 200 pounds on the anchorage, or two-thirds as much as in Fig. 1, so that if we grant an equal strength for both methods of anchoring we still find the evidence in favor of the occlusal one. It also shows that in those cases where the dentin which would naturally form the angle of the step is gone we are still justified in placing our anchorage occlusally instead of grooving the lateral walls. The further away from the main cavity we run the step the greater becomes our leverage, so that in cases which show evidences of strong occlusal force we can, by increasing the length of our occlusal step, guard against this force by strengthening our anchorage, while with a lateral anchorage we could do nothing but enlarge the grooves, and would succeed only in still further weakening the lateral walls.

It may be asked at this point whether in actual practice we ever have fillings moved by this occlusal force. For answer take the mouth of any patient who does an average amount of heavy biting, and with a fine exploring point and magnifying glass carefully ex-

amine all proximo-occlusal fillings that are subjected to stress from an occluding tooth. You will find that it is not an unusual occurrence for one mouth to contain several fillings anchored in the lateral walls that have been moved enough to allow of leakage or even the admission of the fine exploring point. If decay has not taken place under such a filling it is only a question of time until it will, provided the patient has not reached a condition of immunity. There are comparatively few occlusally-anchored fillings that come to me for inspection, so perhaps my evidence is of little worth; but I have yet to see a filling so anchored that has failed for lack of support. They may fail for a variety of other reasons, but they do not move away from the cavity walls.

Just a mention of what might be termed collateral advantages for the occlusal step. In all classes of fillings ready access to the cavity for purposes of light, vision and instrumentation is desirable, and it is found that in distal cavities the cutting of an occlusal step is of great assistance. It so opens the cavity to vision and instruments that it is unnecessary to use hooked or sharply curved excavators to remove the decayed dentin; thus it not only expedites and simplifies the operation, but assists us in being thorough. The complete removal of the decayed dentin being one of the essentials of success, a method that simplifies and insures this is advantageous. When the preparation of the cavity is finished we find it a much simpler task to pack the filling material, especially if it be gold, as our instruments easily reach every part of the cavity and we can see what we are doing.—*Review, July, 1902.*

PYORRHEA ALVEOLARIS—PROGRESS REPORT. By Kenneth W. Goadby, London. Read before the Odontological Society of Great Britain, April, 1902. In a preliminary report I stated that the cultural examination had been undertaken in a number of cases, and that the organisms obtained had been subcultured on various media, to determine, if possible, which if any of the organisms present were invariably found in all cases. By these means a number of well-known organisms, mostly belonging to the common saprophytes, were found, among them the *B. mesentericus ruber* and *vulgatus*. Many members of the yeast family were also found. A culture of one of these isolated from one case produced death when injected into the peritoneal cavity of a guinea-pig; the yeasts

were recovered from the peritoneal cavity, but were not present in the blood.

I have, moreover, often found yeasts in the small masses of tissue adhering to the apices of teeth extracted in pyorrhea cases, but as yet these have not been inoculated into animals. Culturally, they appear to correspond to the ones found in the so-called chronic abscesses. This fact is perhaps interesting when we recall the number of pathogenic members of the Blastomycetes that have come to light in recent years. Miller, I believe, has described a pathogenic yeast present on one occasion in the mouth, but I have not been able to find its description. Klein has described a yeast isolated from milk, which produced a general tissue change with the formation of new growths in various parts of the body when inoculated into animals; all of these tumors were filled with yeasts in various stages of growth. Grasset has described a pathogenic yeast present in an abscess of the mouth. Troisier and Achlaime have also described a yeast, pathogenic for guinea-pigs, obtained from the membrane upon the throat of a patient suffering from enteric fever. Fullerton has investigated pathogenic Blastomycetes and describes several varieties, among them *Saccharomyces tumefaciens albus*, which produces tumor formation when injected into animals. The organism described by Grasset appears to be a similar organism to the one I have obtained. It was pathogenic when injected subcutaneously into guinea-pigs. I have frequently met with yeasts of various sorts in the marginal ulceration in children, and in two cases of pyorrhea in women associated with chronic gastritis and extreme attacks of vomiting. The pathogenicity of these species was not tested.

I have noticed that among the débris from the pus of some of the cases in which these yeasts were shown to be present there were some large and irregular threads and bacilli which gave the granulo-se reaction, and that in some of the cultures of these yeasts there were present threads and elements of mycelial formation which appeared suggestive of the bacillary forms seen in the specimens stained direct. It is impossible to make any definite statement upon this point at present. The direct examination of the pus furnishes some important points, among which may be mentioned the difference seen in the species of bacteria morphologically represented in early and late cases. It is rare to find many cocci present in the later stages, and the field is, as a rule, occupied by bacilli of various kinds

and a good number of threads; among the threads many show a tendency to stain irregularly and in patches, a characteristic that is sometimes met with in the cultivations.

Although cocci are rarely met with in the coverslip direct, they constantly appear if broth cultivations are made from the pus, and among the cocci present the common mouth streptococcus appears with great regularity. Even when the cultivations are made on solid media there is a good deal of difficulty in getting all the organisms seen on the coverslip direct to grow. It does not follow that they cannot be cultivated, but what appears to be the case is that in the mass of organisms are some more or less antagonistic which prevent the growth of each other, probably explaining the curious inconsistency of the species obtained, sometimes the one and sometimes the other organism being able to develop. This, of course, very much complicates the problem, and in addition there are a large number of common saprophytic bacteria of the air that frequently find a lodgment in the mouth. In the cases examined it appears that certain bacteria are generally present and that the others are purely adventitious species, but that of the organisms which are generally present, so far as coverslip indications go, certain ones are very much influenced by the other bacteria developing upon the culture media, so that in some cases they may not grow at all, while in others they are obtained. So far I have been unable to devise a means by which these more exotic bacteria can be always isolated, although I have obtained some of them in pure culture at various times.

By a long process of exclusion certain species have been, I think, excluded from causal relation to pyorrhea, others appear to be related. One organism, a coccus not hitherto described, may perhaps be mentioned, as it is often present in the pus of dento-alveolar abscesses, where it occurs with tolerable frequency, and appears to have some relation to the curious thick viscid pus one finds in some pyorrhea cases. This coccus is also found in the pulps of dead teeth associated with abscesses, and especially in acute oral suppuration. It produces a marked stringy viscous growth upon solid media and is extremely difficult to remove from the agar slant. The broth cultures also form stringy viscous growths which at times adhere to the sides of the tube in the form of a cloud of colonies, about 0.5 millimeter in diameter, that are strongly attached to the glass; particularly does this occur in media containing nitrate. This organism will be referred to at a later date.

I have already mentioned the difficulty that there is in obtaining cultivations of all the bacteria that are to be seen on the coverslip preparations, and it was therefore thought that some additional light on the bacteria of pyorrhea might be obtained by the direct inoculation of animals with the pus obtained from the pockets. There was considerable difficulty in obtaining sufficient material from a given case to perform the experiment. Eventually the following method was adopted: After previously wiping the gums with a piece of sterile wool moistened with sterile water, the pockets were cleared out with a sterile instrument and the material obtained mixed up in sterile broth in the form of an emulsion. The emulsion was inoculated into guinea-pigs and in four instances into rabbits. The inoculations were both intraperitoneal and subcutaneous. The result has given some additional light on the bacteria of pyorrhea and incidentally on the question of oral sepsis.

Twenty-three animals were inoculated, of these nineteen died, some within eighteen hours; the remaining four recovered, but of these two showed local abscess at the site of inoculation, with fluctuation, which cleared up. Several of the animals which succumbed also showed a local abscess which did not burst through the skin, but was gradually absorbed. One guinea-pig showed a local necrosis of the skin. At three of the post-mortem examinations no organisms at all were obtained from the tissues. In one of the cases the local abscess was incised before death, and the contents showed microscopically the organisms that had been noted on the coverslip; there was a good development on broth and a considerable amount of smell evolved. Plate cultures gave only the mouth streptococcus. In no case were staphylococcus aureus and staphylococcus albus present in the blood or in the tissues and kidney; there was no interstitial abscess formation such as noted by Galippe. The staphylococcus noted above was obtained once from a local abscess at the seat of inoculation, and in one case a streptococcus was obtained from the heart blood. In four cases a streptobacillus tending to form rather long threads of unjointed bacilli was isolated.

The organism in each case seemed to be identical, cultivated on various media it conformed to a general type. The pure cultivations were injected subcutaneously in three guinea-pigs with a positive result. From none of the animals inoculated was the pneumococcus obtained from the heart blood, and no capsuled cocci were observed in the blood. This last is perhaps of interest, as the pneumococcus is

frequently present in the saliva, as has been pointed out by Washbourn and Eyre. Kirk has also described a coccus which he thought resembled the pneumococcus as occurring in the abscesses attached to living teeth, and suggested that the infection had arisen from the organisms gaining access through the mucous glands. He, however, does not consider his evidence conclusive. *Bacillus coli* was not obtained from any of the post-mortem examinations on the animals inoculated.

These results are too fragmentary to allow a deduction to be made at present, and serve only to illustrate the complicated nature of the problem; at the same time they in no way tend to show that pyorrhea is a condition generally referable to infection with the common pus-cocci. I must say that at first I was inclined to look on the matter rather from this point of view, but the results of my experiments tend to negative that assumption. It may be that the mouth streptococci were in some way accountable for the animals' deaths, as it is well known that the injection of certain organisms tends to promote the pathological effects of other organisms with which they are injected. Thus, for instance, the virulence of attenuated diphtheria bacilli may be increased if injected into an animal together with the streptococcus pyogenes, an attenuated streptococcus pyogenes by injection with the bacillus coli, an attenuated bacillus of malignant edema by injection with a culture of bacillus prodigiosus, and so on with very many other bacteria. What may have happened, therefore, is that the cocci which often appear on the culture media and do not appear in the post-mortem examinations have so far assisted the pathogenic effect of the other organisms that what would be a non-fatal dose has proved to be a lethal quantity. The cocci to which I refer are the streptococci of the mouth, which appear in almost every culture, and which have been obtained from the site of inoculation in certain cases. That some such interaction and symbiosis does take place is probable, but at the same time I think that there is another explanation to be offered of the pathogenic effect of pus.

In several of the inoculations performed there was no fatal issue, although the cases in no way differed from the ones that gave the positive result, and in several of the inoculations the animal did not die for a considerable time; moreover, in four of the fatal cases no organisms whatever were found in the blood or in the tissues; there was no abscess formation; at the site of inoculation there was at first a slight local reaction, which entirely cleared up before the

animal's death. Examination of the kidney showed no abscesses, and one animal which did not die was killed, and the kidneys examined and found to be entirely normal, and to show no evidence of the abscess formation which is generally associated with the injection of pus cocci (staphylococci). It therefore occurred to me that the organisms concerned in the process might be of the toxine-forming species, and the following experiment goes some way to show that such a probability is possible. A broth culture from a pyorrhea case in which gastric trouble had been in evidence for some time was filtered after seven days' incubation at 37.5° C. The filtrate was inoculated into a guinea-pig weighing six hundred and twenty grams, the amount injected being 4.5 cubic centimeters,—that is, less than one cubic centimeter per one hundred grams body weight of guinea-pig. The animal died in forty-eight hours. Cultivations made at the post-mortem examination from the blood and organs gave negative results. There was a gelatinous exudation at the site of inoculation, and the suprarenal capsules were decidedly hemorrhagic. The rest of the organs were normal. Another filtered culture gave a similar result.

Unfortunately, two experiments are not enough to more than point to a probable existence of toxine, but it is at the same time a point of not a little interest, and the following case strongly confirms the supposition of toxine formation by mouth bacteria. The patient consulted his medical adviser, complaining of weakness and deep-seated pain in the muscles of his legs and thighs. He had difficulty in walking, but no lightning pains or definite ataxia. He could not sleep, and suffered from severe mental depression. He complained of no gastric symptoms beyond a distaste for food, although his mouth was in an extremely septic condition. He had increased knee-jerks and patches of hyperesthesia on the feet. The thigh muscles were tender on deep pressure, but there was no pain along the nerve-trunks. There were no thermal changes and no trophic disturbance. There were no eye changes. There was considerable loss of power to grasp and loss of power in the lower extremities. He was treated for neurasthenia and told to have his mouth attended to, but for some little time refused. Eventually, as he was becoming no better, he consulted me. There was excessive pyorrhea with much pus and considerable destruction of the alveolus. The other symptoms were well marked. The affected teeth were removed and mouth lotions prescribed. Improvement immediately set in, the loss

of power slowly returning, and within six weeks he was practically well, having lost the chief nerve symptoms, although his grasp was still weak.

In attempting a summary of my investigations the large number of conflicting facts makes the task by no means a light one, and the conclusions may be said to be largely negative, but at the same time perhaps there is some additional light on oral sepsis. It appears highly improbable that the ordinary pus organisms, such as the staphylococci, bacillus pyocyaneus, bacillus coli, etc., have any direct share in the production of pyorrhea alveolaris. The absence of the pneumococcus in any of the inoculated animals is also of some interest. The occurrence of members of the blastomycetes, in both the pus and in the tissues surrounding the roots of pyorrhea teeth, is instructive and certainly merits further investigation.

Although it is impossible in the present stage of the research to make a definite statement, there appears little doubt that the organisms, whatever they may be, concerned in the process are pathogenic for animals when injected from the gum margin, and that the progress of the disease would appear to be more nearly related to a toxic condition than to the ordinary condition of suppuration. The relation of pyorrhea to general toxic conditions and septic gastritis, as pointed out by Hunter, certainly receives confirmation, and the fact of the inoculation of the filtered broth cultivations producing pathogenic effects points to the presence of toxins that may have much importance in disease.

CHEMICAL INFLUENCE OF SALIVA ON CEMENT.
By J. E. Hinkins, D.D.S., Chicago. Read before the New York Odontological Society, Jan. 21, 1902. In my paper on "The Disintegration of Cement Fillings" I discussed the two distinct actions on cement—viz., the mechanical attrition and the dissolution under the free margin of the gum—taking account of the various cements as they have been promulgated by their inventors from 1870 to the present day. The purpose was, first, to determine the composition of cements; second, to determine the amount of acid or alkali formed by common bacteria of the mouth; third and last, to see whether those acids or alkalies would dissolve or injure cement. The question now arises, What chemicals are contained in saliva that will influence the cement? We will therefore review the literature of the various analyses and constituent elements of saliva.

Saliva is secreted by several glands situated in the mouth, and represents in its mixed condition a viscid, generally slightly alkaline, tasteless, inodorous liquid of a specific gravity of 1.002 to 1.008. It contains: Water, 99.49 per cent; ptyalin, 0.12 per cent; epithelium and mucin, 0.13 per cent; fatty matters, 0.11 per cent; salts, 0.15 per cent.

Ptyalin, the active principle of saliva, is a ferment which has the power of converting starch into maltose and small quantities of dextrose. Intermediary between the starch and sugar are two products known as erythro-dextrin and achroo-dextrin. Starch is recognized by a deep blue color produced by a solution of iodine and potassium iodide in water. Erythro-dextrin gives a mahogany brown or violet color, and achroo-dextrin, maltose, or dextrose does not color the iodine solution at all. The composition of ptyalin is doubtful. Among the various salts of saliva is found potassium sulfocyanate, as may be shown by the addition of a drop of ferric chloride solution, which produces a deep red color, disappearing on the addition of mercuric chloride (difference from meconic acid).

The quantity secreted daily by a man varies considerably; estimates varying between thirteen ounces and three and a half pounds have been given; 500 to 800 grams is another estimate. Its alkalinity averages in man 0.08 per cent, expressed as sodium carbonate.

The constituents of saliva are: *Organic*: (a) Mucin. Acetic acid precipitates this in a stringy form. (b) Ptyalin, an amylolytic ferment discovered by Leuchs in 1831. (3) Proteid; a trace of a proteid, coagulable by heat and of the nature of a globulin, is constantly present. (d) Sulfocyanide of potassium (KSCN) is usually but not always present in human saliva. *Inorganic*: Small quantities of chlorine and phosphoric acid in combination with potassium, sodium, calcium and magnesium; also small quantities of sodium carbonate. Sodium chloride is the most abundant salt. Schönbein observed that saliva contains a substance which, like nitrous acid, colors blue a mixture of starch and potassium iodide.

According to Hammarsten, the cells of the submaxillary gland contain proteids, of which the most abundant is a nucleo-albumin; they also contain mucin, which passes into the saliva. The sublingual is similar. The parotid cells contain no mucin. A small amount of mucin is, however, obtainable from the investing connective tissue. In myxedema the parotid cells, however, undergo mucoid degeneration. An extract of salivary glands exerts a similar diastatic power to that of saliva, as it contains ptyalin.

Hammersbacher found, in 1,000 parts of the ash from human saliva, potash 457.2, soda 95.9, iron oxid 50.11, magnesia 1.55, sulfuric anhydrid (SO_2) 63.8, phosphoric anhydrid (P_2O_5) 188.48, and chlorin 183.52.

According to Erik Müller, who made extensive investigation of the salivary glands, saliva is formed from typical intracellular granules. He gives the following results of his investigation: 1. The saliva is a product of granules which undergo characteristic transformations. 2. The secretion is present in the gland-cells in the form of small round vacuoles, which are separated from the surrounding protoplasm by a wall which can be stained. These vacuoles were first demonstrated by Retzius in Golgi preparations and by the author in ordinary preparations. 3. These vacuoles are formed in granules in cells. 4. The cells have a different appearance, depending upon their richness in granules; some of them have large, clear granules, separated from one another by a reticulum containing small granules that take the stain; other cells have large granules that can be stained. 5. During very active secretion the granules which can be stained become changed into secretory vacuoles. 6. The secretory capillaries of albuminous glands are all intracellular.

Chittenden and Richards, in a study on variations in the amylolytic power and chemical composition of human mixed saliva, give the following summary of some of their results: "Human mixed saliva contains normally no sodium carbonate whatever; the alkalinity indicated by litmus, lacmoid, etc., is due to hydrogen alkali phosphate, with possibly some alkali bicarbonate. Mixed saliva invariably reacts acid to phenol-phthalein. The alkalinity of mixed saliva as indicated by lacmoid is greater before breakfast than after the morning meal, a conclusion which stands in direct opposition to the statement frequently made that the alkalinity (of mixed saliva) is least when fasting, as in the morning before breakfast, and reaches its maximum with the height of secretion during or immediately after eating. Saliva secreted after a period of glandular inactivity, as before breakfast, manifests greater amylolytic power than the secretion obtained after eating, as observed by Hofbauer. Corresponding with this increase in amylolytic power occurs an increase in the proportion of alkaline-reacting salts, but the increased amylolysis is due primarily to an increase in the amount of active enzyme contained in the saliva. Mixed saliva, whether collected by mechanical stimulation or collected without effort, shows

a natural tendency to vary both in composition and in amylolytic power throughout the twenty-four hours, and apparently independent of the taking of food. Between 7.00 and 11.00 a. m., however, in the absence of food the secretion is remarkably constant. Mechanical stimulation, as chewing a tasteless substance, and alcohol, ether, gin, whisky, etc., taken into the mouth, all lead to the outpouring of a secretion richer in alkaline-reacting salts and in amylolytic power than the secretion coming without stimulation. Mixed saliva resulting from stimulation with ether, alcohol, etc., contains a much larger proportion of mucin than the secretion coming without stimulation, being noticeably thick and viscid. This quality is not apparent in the saliva resulting from mechanical stimulation."

Greenbaum investigated the effect of resistance to secretion upon the percentage of salts in saliva, and upon the work done by the gland, and concludes as follows: "In normal circumstances the percentage of salts in saliva varies with the rate of secretion, increasing as the rate increases and decreasing as the rate decreases." In his experiments he found that when a decrease in the rate of secretion is effected by offering resistance to the flow of saliva, the percentage of salts in the saliva never decreases proportionately and may actually increase. He states that the increase of percentage of salts cannot be attributed to a filtration through the walls of the ductules and ducts, since this process, even if it could affect the percentage of salts at all, would necessarily cause a greater increase in the percentage of organic substance. His experiments show that there is no necessary connection between the increase in the percentage of salts and the increase in the percentage of organic substance.

An experiment was made to determine approximately to what extent the viscosity varies with the percentage of organic solids. A number of specimens of saliva were collected and forced through a capillary tube under a pressure of 10 cm. Hg. Time and quantity were observed and comparison made with distilled water, the viscosity of which was taken as unity. The result was that the viscosity varied with the percentage of salt.

M. Cohen made investigation of the saliva, and reported the following results: He found many indicators useless in measuring the alkalinity because of the large amount of CO_2 in the saliva. Methyl-orange proved to be the most satisfactory, and this gave reliable results. The average alkalinity of the saliva corresponded

to a solution of sodium hydrate of a strength of 0.0154 per cent, although it varied considerably. Cohen is of the opinion that the figures given by earlier authors for the alkalinity have been too high. He found the alkalinity greatest in the morning when the stomach was empty; it decreased in the forenoon, increased again at noon and reached its highest point at this stage. It decreased again in the afternoon and increased toward the time of the evening meal. He never found the reaction acid in normal persons. He calls attention to the fact that the saliva has frequently been found acid in infants and in adults who are the subjects of diabetes or of diseases of the mouth, esophagus or stomach. He observed no relation between the acidity of the stomach contents and the alkalinity of the saliva. He observed some instances of paralytic sialorrhea, also the saliva of patients who had received pilocarpin, and found an unusually high degree of alkalinity; the freezing-point of the saliva in these cases was somewhat more reduced than in normal cases.

Many experimenters have tried to cause absorption of blood exudates or of metabolism products in cases such as pleural effusion and in nephritis. Cohen likewise attempted it, but without definite results. He was unable to observe any marked change in the alkalinity or in the molecular concentration, though the amount of chlorids seemed to be increased. In two instances of chronic parenchymatous nephritis, however, he found the molecular concentration high, as indicated by the lowering of the freezing-point.

F. Kübel brings forth evidence which tends to upset the current doctrine that ptyalin acts best in a neutral or weakly alkaline medium. On the contrary, he finds that even the weakest alkaline reaction hinders it, while a weak acid reaction is highly favorable, especially when the acidity is due to some of the stronger acids, such as HCl. An amount of HCl equal to that in the gastric juice brings the activity of the ptyalin to an end.

According to Krüger, the thiocyanic acid is a constant and normal constituent of human saliva; it does not result from a partial decomposition of the saliva or from carious teeth. The saliva of smokers was found to contain two or three times as much of the acid as that of non-smokers. The quantity of saliva secreted in twenty-four hours (250 to 300 c. c.) was not markedly influenced by cigaret-smoking.

There is no doubt that there are some ingredients contained in saliva that may have influence on the general economy of the human system; if not from the acidity or alkalinity, it may be from a

toxicity; as, for example, the experiments of Pignatti, Morano and Baccarani, who tested the toxicity of saliva from healthy and diseased human beings on rabbits. They found that the saliva was toxic in doses of 20.738 c. c. per kilo of animal. The toxicity varied with individuals within wide limits and seemed to have very little relation to health or disease. There was also no relation to be found between the toxicity and the specific gravity, the degree of alkalinity, or the quantity of ptyalin or mucin. The animals generally died in convulsions.

Again, other authors claim on the contrary, that there is nothing in the ingredients of saliva that would be deleterious to the general health or to the oral organs. Sanarelli, for instance, states that, considering the frequent presence of pathogenic microorganisms in the mouth, it is remarkable that primary lesions appear so rarely, and that wounds heal so kindly there; and sums up by saying that the saliva is an unfavorable medium for certain pathogenic bacteria, destroying them, when they are not too abundant, more or less rapidly, and so altering the type of others—for example, the pneumo-bacillus—as to render them harmless.

Hugenschmidt made investigation of the antiseptic properties of saliva in order to determine why mouth operations are seldom followed by infection. He found that ordinary microorganisms grow rapidly in the saliva, but that, nevertheless, this fluid does have a tendency to keep down infection. Being alkaline, it thus prevents fermentation. It washes away considerable portions of food which tend to lodge on the mucous membrane and dilutes that which remains. Hugenschmidt maintains that saliva stimulates the diapedesis of the white blood-corpuscles in the lymphatics. Even normal saliva contains microbic products, and therefore, because of its attractive power toward microbes, favors phagocytic action, the phagocytosis being due to rapid migration of the leucocytes.

We have heretofore fairly well reviewed the pathological physiology and the chemical action of saliva upon the economy of the human system, including the maxillary glands; but, now, what effect can the ingredients of the secretive oral organs have on cement?—or, in other words, what chemical changes take place when the ingredients of saliva are combined or connected with the ingredients of cement? I will therefore review the contents or the chemicals contained in cement. The principal chemical constituents of cement I find are phosphoric acid, phosphate of alumina, nitric acid, phosphorus, sodium phosphate, zinc oxid, silicate of alumina, mag-

nesium oxid, basic zinc oxid, zinc oxychlorid, zinc phosphate and zinc sulfate, arsenic, antimony, lithium phosphate, borax, boric acid, calcium pyrophosphate, cadmium sulfid, fluorhydric acid, sodium carbonate, powdered glass, silex, sodium borate and magnesium nitrate. I must confess that I am unable to see that there is anything in the combination of the constituent elements of saliva and cements that would be derogatory to each other, if no other element comes in contact with them. But there is an element that comes in contact with them that is a phenomenon to me and which I am unable to explain; that is, I observed that chemical changes take place during the various periods of female life. I find that the saliva of young girls, before they mature, is of lower specific gravity and varies from that in those who are menstruant; and that the saliva in women who have passed menstrual life returns to the same nature as that found in young girls. From this it is evident that the organs of generation influence the circulatory organs, hence the saliva. Another observation which I have made, and which undoubtedly is not new, is the chemical changes that take place in the saliva while operating on the teeth. We find that the saliva changes its chemical constituents while the mouth is open. This possibly may be due to the atmospheric elements of the room or to exorbitant inhalation of carbonic acid gas.

Now to the point: If such morbid changes take place in the chemical constituents of the saliva, from whatever cause it may be, why cannot the same influence produce chemical changes in cement? Therefore it is my opinion that if any derogatory chemical influence takes place in cement, it is produced by the same action and the same cause as in saliva.—*Cosmos*, June, 1902.

SENSITIVENESS OF DENTIN AND ITS TREATMENT.

By Professor Dr. Walkhoff, Munich. *Deutsche Monatsschrift für Zahnheilkunde*. Translated for *International* by Dr. W. H. Potter. In discussing the cause of the sensitiveness of dentin the author declares emphatically against the presence of nerve-fibers in the tubuli of the dentin. He spends considerable space in refuting the views of Morgenstern, who claims to have found nerve-branches in the contents of the tubuli. He agrees with Gysi in that the latter denies the presence of nerve-branches in the tubuli, but disagrees with him in his explanation of the way in which dentin becomes sensitive, Gysi's view being that the contents of the tubuli being semifluid, a pressure

or pull upon the contents of the tubuli was immediately transmitted to the odontoblastic cells, and they in turn acted upon the nerve-fibers which surrounded the cells. Gysi's theory can be called the hydrostatic theory, and does not grant the contents of the tubuli any further share in the establishment of sensitiveness in dentin except as the contents of the tubuli act as confined columns of water and transmit impressions to the odontoblastic cells. The author's views upon this subject can best be understood by the translation of a few sentences. "My view is that we must consider the odontoblastic cell and its projection into the dentinal tubule as physiologically one. . . The projections into the dentinal tubules are an integral part of those cells which by projections are related to other cells of the pulp. These cells are surrounded by numerous actual nerve-fibers, which in some cases enter between the odontoblasts. The zeal with which the presence of nerve-fibers in dentin is sought for by many observers is due to the old idea that the condition called irritability is limited to the nerves of an organism. Physiology long ago overthrew such a view. Irritability, as Verworn has said, is a common peculiarity possessed by all living substance. The tissues of animals which possess no nervous system, and all plant tissue, and even all isolated one-celled organisms react in an outspoken and clear way to all irritation which is brought to bear upon them."

From these considerations the author argues that the contents of the dentinal tubules are capable of receiving an impulse or an irritation and transmitting it to the odontoblastic cells of which they are merely projections, and that the odontoblastic cells are capable of sending on the impulse to the nerve-fibers which immediately surround the cells. And all this is accomplished not by the presence of nerve-fibers in the tubuli, but by the power which all protoplasm has of reacting to an outside stimulus.

The author next considers the clinical diagnosis between normal and hypersensitive dentin. His method is to force by means of a syringe ten or twelve drops of water of a given temperature into a cavity and note the reaction of the dentin. According to his experiments normal dentin reacts at a temperature of 15° to 18° C. That is, a distinct sensation is experienced when water of this temperature is introduced into a cavity. The dentin which reacts at a temperature of 18° to 23° C. is hypersensitive. In this way we have a sure objective means of distinguishing between a purely local affec-

tion of the odontoblasts and their projections into the dentinal tubules, and affections of the pulp, especially the acute form of inflammation. An acute inflammation of the pulp reacts powerfully and continuously at a temperature of 23° to 28° C. A pure hyperesthesia or a normal dentin does not commonly react at this temperature. As to the practical handling of sensitive dentin, it can be accomplished either by a total anesthesia of the tooth, or by a local anesthesia of the ends of the fibrils. The general anesthesia is best accomplished by the application of cold produced by chlorid of ethyl. Care should be taken not to apply the cold where there is an inflamed pulp, as great pain will be produced. But it can be applied very successfully in cases of sensitive dentin and in slight grades of hyperesthesia which react up to 22° C., as described above. If used in cavities which react to a temperature above 22° C., it is a great mistake.

Where cold cannot be used, resort must be had to other means affecting a more local area. Of these the author mentions cocain and chinose. The latter drug acts by favoring the diffusion of the cocain. A stream of warm carbonic acid gas is also recommended. This is said to lower the vitality of tissues with which it comes in contact and to make them less capable of transmitting irritations. The author's latest method is to produce carbonic acid gas in the cavity in a nascent condition, and use in combination some alkaloid, preferably *cocainum nitricum*.

WASTE ENERGY OF COUGHING.—The amount of energy expended in coughing is very considerable; indeed, one of the patient statisticians for which Germany is renowned has calculated that a patient who coughs once every quarter of an hour for ten hours expends energy equivalent to 250 units of heat, which may be translated as equivalent to the nourishment contained in three eggs or two glasses of milk. In normal respiration the air is expelled from the chest at the rate of four feet per second, whereas in violent coughing it may attain a velocity of 300 feet. This waste of energy is especially important, because it occurs, for the most part, in persons whose assimilative functions are already working under difficulties; consequently the ingestion of the corresponding quantity of nourishment by no means compensates for the exertion. It follows that persistent cough is *per se* a manifest cause of emaciation, though there are many other factors which tend in the same direction; hence the desirability of restraining cough within safe limits, especially when it is due to irritative reflexes, such as are excited by laryngitis and pharyngitis. Increased rapidity of expulsion of air without increased exertion is obtained in high altitudes by reason of the low barometric pressure and the consequent diminution of resistance to the exit of the respired air; a fact which explains in part the beneficial influence of high altitudes in diseases associated with cough.—*Medical Press and Circular*.

Letters.

THE BOSS HAS ANOTHER DREAM.

(AS TOLD BY THE OFFICE BOY.)

Me an' the Boss was stringin' up the Clothes Line in the back yard one mornin' an' says he, "James, I had the funniest Dream, las' night; I dreamt I'd Reformed."

The Boss he hid his face behind his hand, kind o' Bashful, an' he give a Little Snigger, like he hoped I'd understand he wasn't claimin' it was reely true, but only a Dream. So I Smiled, an' then he looked Irritated, like he thought I was pokin' Fun at him. But I wasn't, reely. The thing that made me smile was bein' reminded of a Dream I'd had myself. I dreamt he'd paid me Four Dolers on account, an' later on he complained that he couldn't reely Spare the Money, so I had to Pay it all Back.

"Yes, James, I did sure 'nough reform. What brung it about I reckon was this; fer three nights runnin' I've dreamt about Dock Measley, an' how he'd talk to Patients, an' handle them. But las' night, after awhile it seemed like it wasn't Dock Measley at all, but myself. I'd always have the right answer ready fer people, an' I wouldn't git flustered, come what might. Let me give you an instance, an' then you kin jedge fer yourself. I thought a Lady she come in the Offis, an says she, 'Doctor Contour, the bill you sent fer my Dater's work is Exorbitant, simply Exorbitant. My husband was Stunned when he saw it'—an' so on, James; you know how they talk."

"Yessir, I kin finish it myself. Says she, 'They mus' be a Mistake, Doctor. You never filled only four teeth, an' you've charged seven Fillings in the Bill. An' anyhow, her teeth hurt, an' you ain't done the work Good, an' I've come to tell you my husband ain't a-goin' to pay you—not right away, anyhow, ner unless you Throw Off some.' " The Boss he looked kind of amazed to hear me run it off so Slick, an' says he, "You're a Corker on Mimickin', James. Blamed ef I don't Haf Think you'd orter go with a Show. You're too Talented fer a Dentist."

That sort o' encouraged me, so to please him I went on actin' out how the Woman she set a-blinkin' her Eyes, an' a-tappin' with her foot, an' talkin' him down when he tried to put in a Word. The Boss he got to Laughin' so he got all Tangled Up in the Clothes

Line, an' his mouth was so wide open that a Big Fly went Straight Into his Wind-Pipe, an' mighty nigh choked him to death. So after I'd pounded him awhile an' he'd managed to Swaller the Fly the right way, I kind o' let the woman Taper Off an' Run Down, till she come to a standstill. Then I showed how he answered her. Says I (imitatin' the Boss talkin'), "I'm Offul Sorry they's been any mis-understandin', Mis' Browbeater, an' ef you insist the bill is too big, why I reckon it reely is, an' I'll haf to Throw Off somethin'. I don't want none o' my patients to feel dissatisfied, ner do I"—

"Stop, stop, James, "the Boss busted in, "you done the woman part first class, but you—you—why, you cock-eyed little pollywog you, how dare you ridicule me? Right to my face, too! You know well enough I never give in to my patients that away!" I seen I'd went a little too far, an' I'd got to find a excuse, tollable quick. So says I, "What I'm a-tellin' is reely part of a Dream I had myself, somethin' a good deal like your Dream, only it wasn't the same woman, I reckon. I ain't responsible fer dreamin' things, no more'n you are, am I?" says I. So I looked Turrible Injured, an' I guess he allowed he'd better reverse his decision, else I'd call my nine off the field, an' the game would end right there.

Says he, "They ain't no great amount o' Harm done thus far James. Only the nex' time you find yourself a-dreamin' about me givin' in to patients that away, you see to it that you wake yourself Right Up. Sech dreams is Slandrous, an' you hadn't orter have 'em. Now then, you listen to me: I'll set you straight an' then you kin Go On. What I reely replied to that woman—in my Dream—was this. Says I, "Madam, I have only this to say in reply to your objections to my bill—you directed me to do whatever was required for the young lady; you know that she came several times, and you asked no questions as to the probable expense. It is rather late to ask me to discuss the matter of my charges. The bill is just and reasonable, and I cannot change it. If you require time to pay it, we may talk about an arrangement to that effect, possibly, but I cannot consent to any reduction whatever." The Boss he folded his arms an' looked Offul Severe at me, like I was the woman, an' I'd better Watch Out how I tackled a man like him. I was reely clean Took Aback, fer I'd never heered him say nothin' like that to patients. It sounded like it might of been Dock Measley a-talkin'. As I was a-thinkin' that, in come Dock Measley through the back gate.

"What sort o' Racket is this you're a-givin' us?" said he. The Boss he looked kind o' Confused. "Why James is givin' me a little exhibition of his mimickin' powers," says he, an' I could see he suspicioned Dock Measley had heered a good deal that had been said. "James, go on an' show the Doctor the way *he* talks," said the Boss oneasily. I seen by his sayin' this that he meant I was to change the subject an' not make no further reference to him. But I was a-thinkin' jis' at the moment about them Four Dolers he took back from me, an' although it wasn't only in a Dream he done it, it seemed like the Old Nick possessed me to kind o' try an' even things up with him. Dock Measley's bein' there give me Courage, so pertendin' I didn't heer what he said about mimickin' Dock Measley, I went right on tellin' some more about what happened betwixt him an' the woman. Says I, "So then the woman she growed Reel Sassy, an' she jawed right back at you, an' said she'd been told some o' the younger dentists was reely better than you was, an' they'd had advantages you'd never had when you was a student, an' their instruments was more modern, an' they had improved methods, an'—"

"What's all this, James!" the Boss interrupted, blushin' Red Hot. He edged round behind Dock Measley an' stood shakin' his Fist at me. "W'y it's the way I reckon that woman answered you in your Dream," says I. "After you'd told her you always tried to keep your prices as low as the lowest, an' you hoped she wouldn't think you meant to take any Advantage o' her, an' git mad an' go somewhere else to git her work done." The Boss looked Dumfounded. "Why, James, that wasn't what I dreamed at all; I never told you I dreamt anythin' in the leas' resemblin' what you've jis' said, that about my tellin' her I always tried to keep my prices so low, an' hopin' she wouldn't leave me, an' so on. What ails you, all of a sudden!"

I looked as Dum'-Headed as possible, like I couldn't believe my Ears, hearin' him deny what I said he'd said. He was beginnin' to git Bilin' Mad now, seein' how I was makin' him Redick'lus in Dock Measley's eyes. The wus he stared at me the wuss Rattled I let on to be, like he'd told me on the Sly how to act, heerin' Dock Measley a-comin', an' I'd fergot, an' got all Muxed Up through his tryin' to set me Straight. Dock Measley he was Listenin' Clost, like he didn't want to miss a word. So after

blinkin' a minute, like I couldn't hardly Ketch on again, through the Boss's interferin' so, I went on—"Then the Lady she said your apologies an' explanations was all N. G., an' wouldn't Go Down, an' you'd simply lost a desirable family, an' no help fer it. She said your patients, lots o' them, had often said they'd noticed you wasn't doin' the kind o' Work you ust to"—

Here the Boss he flew in a sudden Frenzy, like a Bee had got up his Pants Leg, an' before I could get out of the Way he landed a Slap on my Ear that sent me down fer the Count. I was up agin right away, an' expectin' to Ketch one on the Jaw that would end the Fight, fer I seen I was overmatched. But the strangest thing happened jis' then—the Boss he Fell Down like Fitz had countered on him, an' was a-wallerin' in the grass like it was a attack o' Upperlipsy, screamin' an' Frothin'. Dock Measley he out with his Lead Pencil an' jammed it betwixt the Boss's teeth, so's he wouldn't bite his Tongue, an' the Cedar Chips flew like a Corn-Shuckin' Machine. "Set on his head!" Dock Measley yelled. So I done it, an' us two managed to hold him Down, Dock Measley a-settin' on his Haunch at the same time, like he was a Hoss that had fell down an' busted a Shaft, an' was a-tryin' his best to Rare Up an' knock over a Sky-Scraper. Every other Second er so the Boss would give a Herculaneum Heave, a-tryin' to sling Dock Measley an' me off. But we stuck to him, an' I stuffed some Grass in his mouth, an' stuck him with a Pin, to let him understand me an' Dock Measley was bossin' this Job, an' it wasn't no time fer Foolishin'. Before long he showed signs o' Givin' In. Says he, "James, you Souse-Headed Son of Belial, lemme up. Lemme up, I tell you!"

Before I could say whether I would er I wouldn't, Dock Measley Spoke Up. Says he, "I've got somethin' to say about this. Before you Git Up you're a-goin' to promise a few things. This dreamin' is all very fine, but what you need is a little more actin'. You've been doin' a stack o' Missionary Work fer years, in a field where it wasn't called for, an' wasn't in the least appreciated. You've been doin' good dentistry, conscientious, reliable work, at second-rate Cobblers' terms, an' throwin' in Apologies, an' all because you haven't had the Spunk to claim Perfessional Fees. It ain't so mutch because you're reely philanthropic that you've done this, but because you haven't cultivated Backbone. An' because you *have* been doin' reely good work, competin' in Prices with the lowest

down, mos' Ornery an' mos' Conscienceless quacks in the trade o' dental practice, your offense agin the Perfession is only a trifle less heinous than your offense agin your own Family. Now, then, do you apologize fer the great wrong you've done your Perfessional Brothers, an' their wives, children, an' other dependents, by your thoughtless prostitution of your talents?"

"I do," said the Boss in a Faint Vois, like he was Gittin' Married.

"An' you promise to give out, so everybody will know, that you've raised your prices?"

The Boss kind o' Balked at that, but Dock Measley motioned to me, an' I prodded him with the Pin, till he Yelled an' promised.

"You promise furthermore to stop an' consider, the nex' time a Young Lady chewin' Gum comes sailin' in, an' she tells you in advance she don't want to pay mutch, an' she's got on a new Chiny Silk dress, an a Seven Doler sun-shade—you'll stop an' consider, I say, that this same young lady is probably on her way to the Milliner's, even then, an' she'll pay Eighteen Dolers fer a Hat, an' never Wink?"

"Ye-es," said the Boss, not seemin' to Understand.

"An' she'll buy four hats a Year, at them rates, an' yet expect you to put in Five Hours workin' at Two Gold Fillin's, an' charge her Four Dolers?"

"Ye-es."

"Prod him agin, James," muttered Dock Measley. So I done it, an' when he'd done Yellin' Dock Measley said, "That's fer not seemin' to Appreciate what a Sinner agin the Perfession you've been. Now another thing—you promise when you start in to say your little 'Now-I-lay-me' at bedtime, that you'll ast to be helped to remember to recollect not to ferget that you're a member of a Reel Perfession, an' entitled to ast perfessional fees, an' not keep a-thinkin' all the time, oh, what ef I should lose this Patient? My, my, what ef I should!"

The Boss promised, but he didn't seem to be Offul Mutch impressed. So then Dock Measley he added a few more Pious Reflections, calculated to Clinch the work of Reform, an' let him up. The first thing the Boss done was to land a Kick on me that like to of Drove the Patch of my Trousers into the top of my Hat. An' he never offered to Tech Dock Measley.

Cincinnati, O.

FRANK W. SAGE, D. D. S.

PAPAIN—REPLY TO DR. LATHAM.

Chicago, October 4, 1902.

To the Editor of the DENTAL DIGEST.

DEAR SIR:—In the July number of the DIGEST Dr. Vida A. Latham intimates that I have claimed something about the use of papain to which I am not entitled. In reply I will give a quotation from my paper read in Paris, 1900 (see page 160, Vol. I, Transactions of the Third International Dental Congress): "In times past the digestion of animal tissue has been accelerated by the use of pepsin or some of its preparations, and of starchy matter by taka-diastase. In the year 1881 Van Antwerp of Kentucky discovered that the fresh leaves of the paw-paw or *Carica papaya* would digest fresh meat, beefsteak and other animal flesh." I think the insinuation that I claimed credit for something to which I was not entitled falls flat in view of the above.

For the benefit of your readers who do not know about papain, I will say that it was isolated in the year 1879 by Peckboldt under the name "papayatin," and by Wurtz and Bouchut, 1879, who called it "papain." This was not generally known for some time, and Van Antwerp's discovery was made independent of the above. So far as I know, I was the first to use papain for digesting pulps, as Oakley Coles had used only pepsin, and he discarded it between 1870 and 1880. I am the author of the formula of hydrochloric acid, Price's glycerin, and papain, for the purpose of pulp digestion, and the remarks of Dr. Latham simply show that she does not read very carefully the *Dental Cosmos*, the *Dental Review* or the DENTAL DIGEST, all of which journals published my paper. If she will only try the papain paste on the next case of dead pulp, where it is difficult to remove it from the twisted roots of a tooth, she will be glad there is such a drug as papain, and she will be willing to credit me with its first proper scientific introduction to the profession for dental purposes.

Respectfully yours,

A. W. HARLAN.

SENSIBLE ADVICE.—Tommy and Johnny were playing doctor and patient. Johnny was the patient. He was supposed to be suffering from some deep-seated and mysterious malady. Dr. Tommy felt his pulse, took his temperature by means of the kitchen thermometer, thumped his chest and noted his respiration. "What you need, my dear sir," he said, "is to go and wash your feet. Five dollars, please."—*Chicago Record-Herald*.

The Dental Digest.

PUBLISHED THE FIFTEENTH DAY OF EVERY MONTH

At 2231 Prairie Avenue, Chicago,

Where All Communications Should be Addressed.

Editorial.

PROFESSIONAL ETHICS VERSUS PATENTS.

The leading article in this month's issue is a paper with the above title, by Dr. C. E. Bentley. If it were not for the fact that we have been asked to read a paper on the subject of patents before the next meeting of the Illinois State Dental Society we would discuss this question in detail. However, we cannot let the matter pass without calling attention to the paper and putting ourselves on record as unalterably opposed to the principles contained therein. Dr. Bentley is quite as forceful in writing as he is eloquent in speaking, and we sometimes wonder if in his enthusiasm he does not occasionally mislead himself by his own sophistry. On no other ground can we explain his attitude, as we must give him the credit of being sincere in what he says.

If an inventor should not patent the fruit of his labors, an author should not copyright his books or reap any benefit from the sale therefrom, but should simply either give them away or sell them for the actual cost of printing and binding. In discussing the paper the authors of several copyrighted books thought dentists should not take out patents, but said nothing about dentists taking out copyrights. Dr. Bentley also was strangely silent on this point. If he were familiar with the present copyright laws he would not quote Prof. Townsend, who wrote on the subject fifty years ago, as the laws are vastly different now from what they were then, giving the author of the present day much more protection. We cannot see any difference between the principle of copyright and patentright.

Dr. S. G. Perry is quoted as saying in 1889 that he was sorry he had ever taken out a patent. Dr. Bentley omitted to quote from Dr. Perry's last paper on the subject, written in 1901, wherein he upheld patents in the strongest terms, stated that it was perfectly ethical for a dentist to take them out and reap the benefit therefrom, and showed that the inventions which he had patented had been put on the market and were thought to be of considerable benefit to the profession,

while those which he did not patent, although he considered them just as valuable, had been lost to the profession because no manufacturer could afford to manufacture them without being protected in their sale.

A great scientist has remarked, "If a good idea were lying in the gutter free to all it would pay the community to make a present of a patent for it to any man competent to work it." The value of an invention depends upon its being put in the hands of those for whom it is intended, and this cannot be done unless it is patented. A good illustration of this principle is found in carborundum. A French scientist discovered that compounds of carbon with boron and silicon formed a magnificent abrasive. He did nothing in the matter, however, so no one benefited by his discovery. About the same time another scientist, working quite independently, also discovered the carbo-silicon compound. He did not merely record the scientific fact of discovery, but patented the process, with the result that while the first man's discovery did not directly benefit humanity one particle, the latter gave to the world the greatest abrasive ever produced, and no class has benefited more thereby than the dental profession.

We see no more reason why a dentist should give his time, money and energy to the profession without compensation than that he should serve his patients without making any charge for his time and material. What right have the great rank and file of the profession, who possess no inventive genius, and who make their living by the practice of dentistry, and who are dependent therein upon instruments and other mechanical appliances, to say to the inventor, even though he be a dentist: "It is unethical and unreasonable in you to reap any benefit from your labor and talent by taking out patents, even though we are greatly aided by having your inventions."

The essayist quotes the following sentence from Emerson: "He is base who receives favors and renders none," and then says: "A man who thoroughly assimilates this truth will be only too glad to give his very best, in order that he may escape the baseness of only receiving." The essayist thinks the inventor should not receive anything in return for what he gives to the profession, but he considers it perfectly proper for the entire dental profession to take from the inventor without giving anything. Who then would "escape the baseness of only receiving?"

Notices.

OHIO STATE DENTAL SOCIETY.

The thirty-sixth annual meeting of the Ohio State Dental Society will be held at the Great Southern Hotel, Columbus, Dec. 2-4, 1902. Members of the profession are cordially invited to be present.

S. D. RUGGLES, Secretary, Portsmouth.

MARYLAND STATE BOARD OF DENTAL EXAMINERS.

The Maryland State Board of Dental Examiners will meet for the examination of candidates for certificates, Nov. 5-6, 1902, at the Baltimore College of Dental Surgery, Eutaw and Franklin streets, Baltimore, beginning at 9 a. m. Application blanks and all information will be furnished by the Secretary.

F. F. DREW, Secretary, 701 N. Howard St., Baltimore.

CONNECTICUT DENTAL EXAMINERS.

The Dental Commissioners of the State of Connecticut will meet at Hartford, Nov. 11-13, 1902, to examine applicants for license to practice dentistry, and for the transaction of any other proper business. The practical examination in operative and prosthetic dentistry will be held Nov. 11, at 9 a. m., in Putnam Phalanx Armory, corner Haynes and Pearl Streets. The written theoretic examination will be held Nov. 12 and 13, at the Capitol. All applicants should apply to the Recorder for proper blanks, and for the revised rules for conducting the examinations. Application blanks must be carefully filled in and sworn to, and with fee, twenty-five dollars (\$25.00), filed with the Recorder on or before Nov. 4, 1902.

By direction of the Dental Commissioners.

J. TENNEY BARKER, Recorder, Wallingford.

RESOLUTIONS OF CENSURE ADOPTED BY PUBLICATION COMMITTEE OF ILLINOIS STATE DENTAL SOCIETY.

Whereas: Frink & Young, the publishers of the *American Dental Journal*, and J. B. Dicus, its editor, have taken the liberty of publishing under the head of an abstract literally almost the full text of a paper entitled "Professional Ethics vs. Patents," read before this Society at its last meeting, without the consent of the Society, the author, or the DENTAL DIGEST, that journal being the authorized publisher of the proceedings; and,

Whereas: Such usurpation of the prerogatives and privileges of the Society must be regarded as a flagrant violation of professional ethics and editorial courtesy; therefore, be it

Resolved, That the Publication Committee of the Illinois State Dental Society hereby censures the said journal and its editor for an action which cannot be countenanced as professional, ethical or honorable; and be it further

Resolved, As a matter of precedent, that this action be reported in the

proceedings of the Society, and published in the DENTAL DIGEST simultaneously with the appearance of the article referred to.

(Signed)

H. J. GOSLEE,

D. M. CATTELL,

G. W. DITTMARR,

Publication Committee Illinois State Dental Society.

NORTHEASTERN DENTAL ASSOCIATION.

The Northeastern Dental Association held its annual meeting Oct. 15-17, 1902, and elected the following officers: President, John F. Dowsley, Boston; Vice-Presidents, Henry McManus, Hartford, Conn., T. J. Barrett, Worcester, Mass.; Secretary, E. O. Kinsman, Cambridge, Mass.; Assistant Secretary, C. F. Kreppel, Forest Hills, Mass.; Treasurer, J. Tenney Barker, Wallingford, Conn.; Librarian, C. H. Riggs, Hartford, Conn.; Editor, D. W. Johnston, New Haven, Conn.

COLORADO STATE BOARD OF DENTAL EXAMINERS.

The Colorado State Board of Dental Examiners will meet in Denver, Dec. 2, 1902, at 9 a. m., for examination of applicants for license to practice dentistry in Colorado. In addition to written and oral examinations applicants must supply their own patients, instruments and material, and come prepared to do practical work under the supervision of the Board, which will pass upon suitable selection of cavities. All applications must be completed prior to Dec. 2, 1902. For application blanks and information address

H. F. HOFFMAN, Secretary,

California Bldg., Denver.

INTERNATIONAL DENTAL FEDERATION.

Stockholm, Sweden, Aug. 21, 1902.

The Executive Council of the International Dental Federation, charged by the Third International Dental Congress with the organization of the succeeding congresses, having received the invitations addressed by the National Dental Association, the Governor of the State of Missouri, the Mayor of the City of St. Louis, the National Association of Dental Examiners, the Missouri State Dental Association, the St. Louis Dental Society, the Society of Dental Science of St. Louis, the Odontographs of Western Missouri and Eastern Kansas, these being regularly represented at the Stockholm sessions by Messrs. Truman W. Brophy, William C. Barrett and Eugene H. Smith, accredited for this purpose.

Considering, on the one hand, First, That the progress of dentistry in the interval of four years seems insufficient to warrant a scientific interest in a fourth international dental congress after the one that was held in Paris in 1900. Second, That it would have been desirable that the forthcoming congress should be held in a country in which a similar international reunion had not been held before. But considering, on the other hand, Third, That universal expositions attract a considerable number of visitors from all

countries, and offer an occasion especially favorable to the success of international congresses. Fourth, That several international congresses will be held upon the occasion of the St. Louis Universal Exposition, and that it is convenient that odontology should be represented. Fifth, That until now no other invitation has been received from any other country. Sixth, That it is desirable to reach an early decision, so as to give the necessary time for a good preparation. Seventh, That the good organization of the congress is assured by the number and worthiness of the invitations received.

Accepts the invitation and decides that the Fourth International Dental Congress shall be held in the month of August, 1904, in the city of St. Louis, Mo., United States of America.

The undersigned certifies that this is an extract of the Proceedings of the Executive Council, and that it is an exact copy of the letter to be sent in reply to the invitation received.

THE SECRETARY GENERAL.
(Signed) DR. SAUVEZ

RESOLUTIONS BY LOUISVILLE DENTISTS.

At a meeting of the dentists of Louisville, held at the office of Dr. B. O. Doyle, Friday, Sept. 26, 1902, the following resolutions were adopted: "In the midst of Life we are in Death. The Angel of Death cometh at a time when no man can tell. Truly has he come to summon our associate and colaborer, Dr. Geo. S. Seymour. Mingling with him but a few hours ago, we are suddenly shocked by the announcement that he has gone from among us. While we bow in humble submission to the will of Him who doeth all things well, we desire to give expression to our sense of the loss our profession has sustained in the taking from our ranks of one who for many years has labored in this community, standing ever ready to maintain the honor and dignity he felt was so justly its due. Therefore, we are here assembled to honor his memory, and to extend to his wife and family our earnest and most tender sympathy in this hour of their sad bereavement.

"Resolved, That a copy of this preamble and resolutions be sent the family, and furnished the dental journals and daily papers for publication.

"DR. CHAS. E. DUNN,
"DR. C. G. EDWARDS,
"DR. J. H. BALDWIN,
Committee."

SPITTOONS, TO KEEP CLEAN.—In the August DIGEST a London dentist advocates sprinkling a little sulphate of copper in the spittoon each morning to prevent any unpleasant odors. Others find that chlorid of lime is the great disinfectant and deodorant. I would advise the gentlemen, if they do not use the fountain cuspidor, to try washing their spittoons with water after each patient, and not allow the deposits to become so great and stale as to be odorous. If you have not a porter, do it yourselves, and your patients won't think any the less of you.—*J. L. Lindsay, Poplar Bluff, Mo.*

News Summary.

D. E. SORG, 32 years old, a dentist at Pittsburg, died Sept. 19, 1902.

D. H. WEBSTER, a dentist at San Antonio, Tex., died Sept. 22, 1902.

WM. JACKSON, a dentist at Albany, Ky., died of typhoid fever, Oct. 1, 1902.

A. E. CHERKY, 75 years old, a dentist of Oneida, N. Y., died Oct. 8, 1902.

H. D. CURRIE, a dentist at Cambridge, Mass., died suddenly Sept. 15, 1902.

J. T. ENOS, 54 years of age, a dentist at Salinas, Cal., died Oct. 6, 1902.

T. B. LEGARE, 59 years old, a dentist at Columbia, S. C., died Oct. 4, 1902.

A. E. KENNEDY, for many years a dentist at Morrison, Ill., died Oct. 5, 1902.

B. S. MORRILL, for many years a dentist at Hastings, Neb., died Oct. 1, 1902.

R. S. MCARTHUR, a young dentist at Dublin, Ga., died Sept. 30, 1902, from typhoid fever.

J. W. HUNTER, 70 years old, a dentist at Winston-Salem, N. C., died Sept. 20, 1902.

J. L. CLARK, 78 years of age and formerly a dentist at Waterloo, N. Y., died Sept. 7, 1902.

B. P. ELDRED, 32 years old, a dentist at Lanesboro, Minn., died of Bright's disease, Sept. 28, 1902.

G. S. SEYMOUR, 65 years of age, a dentist at Louisville, Ky., committed suicide Sept. 24, 1902.

R. E. WYATT, a dentist at Wyoming, O., 40 years of age, died Oct. 6, 1902, from Bright's disease.

E. B. RICH, 23 years of age, a dentist at Wyethville, Va., died Oct. 12, 1902, from consumption.

T. A. PATTISON, 28 years of age, a dentist at St. Cloud, Minn., died Oct. 8, 1902, from appendicitis.

J. P. GARVIN, 35 years of age, a dentist at Fond du Lac, Wis., died of consumption, Sept. 26, 1902.

J. R. PALMER, 74 years of age, and for many years a dentist in Texas, died at Dallas, Sept. 27, 1902.

E. R. TANNER, 30 years of age, a dentist at Ramona, Ind. Ter., died Oct. 8, 1902, from an overdose of morphin.

R. V. BLAKE, a dentist of San Francisco, was shot and probably fatally wounded on Oct. 16, by his partner, Dr. D. F. Stoll.

BANKRUPT.—W. H. Cummings, Pittsfield, Mass., liabilities, \$2,038.43; assets, \$185.—C. C. Winfrey, Mayfield, Ky., liabilities, \$2,245; no assets.

FIRES.—Dr. Campbell, Malone, N. Y., Oct. 2, total loss.—A. C. Clark & Co., Chicago, Oct. 3, \$40,000 loss.—Dr. Frazier, College View, Neb., Oct. 1, total loss; no insurance. Fire caused by the explosion of a gasoline stove.—

A dentist at Lincoln, Neb., was burned out this month by a fire caused by the explosion of a vulcanizer.—A. H. Tunks, Hopkinsville, Ky., Sept. 24, loss, \$750; insurance, \$400.

TOLEDO (O.) DENTAL SOCIETY elected the following officers Sept. 30, 1902: President, A. J. Wolfert; Vice-President, E. D. Gardiner; Secretary and Treasurer, L. L. Sheffield.

CANADIAN DENTAL ASSOCIATION elected the following officers this month: President, J. B. Willmott; Vice-President, E. Dudeau; Secretary, C. Trotter; Registrar, S. W. McInnes.

PORCELAIN FLOORS FOR DENTISTS.—Dr. O. W. Randall, in *Items*, makes a strong plea for a porcelain floor in all dental offices, his main argument being on the grounds of cleanliness.

SOUTHWESTERN IOWA DENTAL ASSOCIATION met at Clarinda, Oct. 15, 1902, and elected the following officers: President, J. A. Ross; Vice-President, R. E. Chandler; Secretary, J. A. West.

DENVER (COLO.) DENTAL ASSOCIATION elected the following officers Oct. 10, 1902: President, W. L. Roberts; Vice-President, W. A. Brierley; Secretary, F. L. Smith; Treasurer, W. P. Smedley.

COMMISSION WANTED.—Patient—Vat! Do you mean to sharge me two tollars to visit? Doctor—That is my regular rate to everyone. Patient—Yase, but I indroduced der disease into der neighborhood!—*Life*.

JOE DAVIESS COUNTY (ILL.) DENTAL ASSOCIATION was organized Sept. 15, 1902, and the following officers were elected: President, J. J. Creswell; Vice-President, W. R. Russell; Secretary and Treasurer, A. R. Speer.

ROCHESTER (N. Y.) DENTAL SOCIETY on Oct. 14, 1902, elected the following officers: President, F. Messerschmitt; Vice-President, F. Tarrant; Secretary, F. W. Proseus; Treasurer, W. A. Windell; Librarian, W. W. Belcher.

SOUTHERN ILLINOIS DENTAL SOCIETY elected the following officers Oct. 15, 1902, after a two days' meeting at Alton, Ill.: President, J. M. Barcus; Vice-President, E. L. Burroughs; Secretary, H. K. Barnett; Treasurer, T. T. Baker.

NO COMPLIMENT.—"You bear it like a little man," said the dentist, after he had pulled the tooth. "Huh!" exclaimed Tommy, "I'm a heap grittier than that. I bear it like a little woman." For Tommy was an observant boy.—*Chicago Tribune*.

THE FIRST DISTRICT DENTAL SOCIETY OF ILLINOIS held its twentieth annual meeting at Rock Island, Sept. 23-24, 1902, and elected the following officers: President, C. B. Warner; Vice-President, A. I. Sargent; Secretary, H. W. McMillan; Treasurer, L. W. Skidmore. The next meeting will be held at Macomb.

SPAIN'S COURT DENTIST IN CHICAGO.—Dr. Floreston Aguilar of Madrid, Spain, dentist to the royal family, was in Chicago for a few days in September. Some of the dentists here gave him a complimentary dinner. He came to this country to visit the leading dental colleges, and as a representative of the Spanish government, to invite leading members of the medical

profession to attend the Fourteenth International Medical Congress at Madrid next April.

NORTHERN ILLINOIS DENTAL SOCIETY elected the following officers, Oct. 15, 1902: President, F. T. Bell; Vice-President, W. T. Reeves; Secretary, A. M. Harrison; Treasurer, M. R. Harned. The next meeting will be held at Freeport, Oct. 16-17, 1903.

ILLEGAL PRACTITIONERS.—Last month a dentist was arrested and fined \$25 and costs for practising in Vermont without a license.—Oct. 1 three men employed by a dental parlor at Patchogue, N. Y., were each fined \$50 and costs for practising dentistry without a license.

NORTHERN INDIANA DENTAL SOCIETY elected the following officers Sept. 25, 1902: President, M. A. Payne; Vice-President, S. B. Hartman; Secretary and Treasurer, J. A. Stoeckley; Executive Committee, A. L. Stephenson, Clem Shidler, F. H. Irwin, C. G. Kechin.

EXAMINING BOARD AFFAIRS.—This month the Minnesota State Board of Dental Examiners passed 14 out of 26 applicants for license.—The Pennsylvania State Board met this month, and elected the following officers: President H. E. Roberts; Secretary and Treasurer G. W. Klump.

GOLF FOR WRITER'S CRAMP.—Several sufferers from writer's cramp are reported to have obtained great relief by playing golf, as the game requires the use of the upper extremities just to the degree necessary for people who live sedentary lives. It ought to be a good thing for dentists.

SOMETHING IN STORE FOR HIM.—Doctor—I think you understand fully now the directions for these medicines, and this is for your dyspepsia. Patient—Why, I haven't dyspepsia, Doctor! Doctor—Oh, I know, but you will have it when you have taken all those other medicines.—*Tid Bits.*

FRATERNITY WINS SUIT.—Not long ago we reported that a dentist at Port Byron, Ill., had been injured while being initiated into a secret order, and had brought suit for damages for a large sum. The case has just been decided against him, thus establishing a precedent for this sort of thing.

PLATING ON A LARGE SCALE.—A woman at Alton, Ill., recently went to the office of a plating company, and, pulling her false teeth from her mouth, she handed them to the manager and stated that she wanted the whole thing gold-plated. She will certainly attract attention enough to satisfy her vanity.

HARTFORD (CONN.) DENTAL SOCIETY elected the following officers, Oct. 13, 1902: President, J. W. Harper; Vice-President, Edward Eberle; Treasurer, E. R. Whitford; Secretary, A. W. Cowee; Executive Committee, E. A. Abbey, T. K. Starr, A. E. Carey; Librarian, F. D. Clark; Historian, Chas. McManus.

DAMAGE SUITS.—A man in Portland, Ore., has sued his dentist for \$1,000 damages, claiming that two gold crowns placed on his teeth did not fit, and caused ulceration of the gums and blood-poisoning.—A man at Keokuk, Ia., recently sued his dentist for \$2,000 damages, claiming that the wrong tooth had been pulled and that his eyesight, digestion and capacity for work were affected thereby. The case was decided in favor of the dentist.—A woman

in Watertown, Conn., has sued her dentist for \$250 damages, claiming that he took a gold bridge from her mouth and refused to return it.

GOOD ADVICE.—A prominent medical teacher writes: "For a student not afflicted with an idiosyncratic susceptibility to cephalic elephantiasis, and with the ability to learn and a willingness to work, there is no more wholesome and helpful training than service under (not with) a good, earnest, capable and successful physician."

INSPECTION OF TEETH OPPOSED.—It is reported that the New York City board of education has decided to bar inspection of the school children's teeth by dentists, because the parents seem to take it as a personal reflection on them when a child takes home a statement from the examining dentist that his teeth needed to be fixed up.

TEETH SAVED HER LIFE.—A twelve-year-old girl in Bath, Me., was recently accidentally shot by a younger brother who was playing with a revolver just a few feet from her. The upper cuspid and first and second bicusps were shattered to pieces and the first molar was knocked out, but this was the extent of the damage.

X-RAYS AT FAULT.—A few days ago a man in Cleveland thought he had swallowed his false teeth while asleep, and the X-rays disclosed a swelling in the throat. He submitted to operation, but no teeth were found, and the swelling was shown to be due to laryngitis. The teeth were found in the man's bed, but he will probably die from the operation.

PRESCRIBING BY WIRE.—For many years it has been the practice in remote parts of South Australia for people to telegraph their symptoms when they were sick to some doctor in the nearest town. He would wire back a prescription, which would be filled by the postmaster, who had a supply of drugs on hand. The government has, however, abolished the system.

ADVANCED PEDIATRICS.—The *Rochester Union and Advertiser* says that a Canadian firm, in an advertisement of a new nursing bottle it had patented, after giving directions for the use of the bottle, concluded as follows: "When the baby is done drinking it must be unscrewed and laid in a cool place under a tap. If the baby does not thrive on fresh milk it should be boiled."

ILLINOIS STATE BOARD HONORED.—Oct. 18, the dentists of Chicago gave a banquet to the members of the Illinois State Board of Dental Examiners, to J. J. Knickerbocker, attorney, and to Dr. J. N. Crouse, as a testimonial of their appreciation of the work which these men have done in suppressing the bogus diploma mills of Illinois. Over 100 dentists were present, including several guests from other states.

ULCEROUS NEOPLASM OF TONGUE OR BUCCAL CAVITY.—E. Lenglet concludes that: Excision of a bit of the lesion, followed by microscopical examination, is the surest, most rapid and least troublesome method for determining the nature of doubtful neoplastic ulcerations of the mouth and tongue. It allows the institution of rational treatment in each variety of these lesions. When this method cannot be followed, there is recourse to the injection of calomel, knowing that it may ameliorate epitheliomata, and diminish connective tissue infiltration, but it must be remembered that valuable time

may be lost in this way, as more time may be consumed than is strictly necessary for the confirmation of the diagnosis. Iodid of potassium should never be employed in doubtful cases, since it is so harmful in cases of epitheliomata.—*La Presse Med.*

GRAVE DANGER. AVERTED. Certain thoughtful scientists have found out that the universal habit of using the teeth on the left side more than those on the right in chewing is slowly but surely working the human mouth over to the left side of the face, and that in a few thousand years it will be close to the left ear. The warning may have come in time, providentially, to save mankind from such a horrible fate.

DIVORCES.—Mrs. Ludwig A. Meyer has brought suit for divorce and alimony against her husband, a dentist in Cleveland.—Mrs. M. B. Pine has brought suit for divorce against her husband, a dentist of Chicago.—Mrs. H. M. Frey has brought suit for divorce against her husband, a dentist of Chicago.—Mrs. Emily L. Dutton has been granted a decree of divorce from her husband, B. W. Dutton, a dentist of Chicago.

O, PSHAW.—When the Shah of Persia was in France recently he had toothache, but the arrival of the dentist caused it to disappear, as is often the case. The Shah said that he did not want the dentist to lose his time, so commanded that each member of his suite should have a tooth extracted. He turned his back on them when he said this, and when he looked around he found, to his amusement, that every member of the staff had quietly slipped away except the Grand Vizier, who was toothless. The dentist was dismissed with a handsome present.

ROBBERIES.—Sept. 28, a dentist in Quincy, Ill., lost \$25 in gold. Several complaints have come from towns in that section.—Sept. 20, a dentist at Iowa City, Ia., lost over \$100.—Sept. 20, the office of a dentist at Cedar Falls, Ia., was robbed of \$25 in gold.—Sept. 12, sneak thieves robbed the office of a dentist at Rochester, Minn.—Sept. 30, a dentist at Hannibal, Mo., was relieved of \$25 worth of gold plate and other goods.—Oct. 2, two offices at Kingston, N. Y., lost about \$110 through burglary.—Sept. 20, a dentist at Rochester, N. Y., found himself \$150 poorer through the visit of sneak thieves.

FAILURE TO APPEAR BEFORE BOARD—REVOKING LICENSE.—The Supreme Court of Vermont says, in the case of Stevens vs. Hill, that the petitioner got himself licensed to practice medicine on the strength of a diploma from a college in Ohio. The board of censors who licensed him became suspicious that the diploma was bogus, and sent him word that they wanted to see it again. He promised to come, but failed to keep his word. Finally they had him summoned to appear and show cause why his license should not be revoked as having been procured by fraud in presenting a forged and spurious diploma. He did not appear, and the board revoked his license, basing their action, as they stated, partly on the affidavit of the secretary of the Ohio college that no such person as the petitioner had ever been granted a diploma therefrom. His request for a writ of certiorari, by which he hoped to get the case before the court for review, was put on the ground that the board acted without any evidence, in that the affidavit was not taken on notice to him. But the Supreme Court declares that it could not be said that the affidavit was no evi-

dence. If the petitioner wished to insist on formal and regular proof, he should have made his appearance. He chose to stay away, and it was not just that he should take the objection by this extraordinary writ. He had his day in court, and must be treated as having waived such formal objections as much as if he had been present and held his peace. Wherefore, the writ was denied.—*Jour. A. M. A.*

BLOOD-COUNT IN MUMPS.—Pick (*Wiener Klin. Rundschau, Jour. A. M. A.*) relates that more than 623 cases of mumps have occurred in Prague during the last 71 weeks, and the epidemic has included an unusual number of adults. The blood-count in ten cases examined showed that the number of leucocytes was constantly normal. The lack of hyperleucocytosis may aid in differentiating mumps from orchitis of other origin, gonorrheal for instance, which was accompanied by a leucocytosis of 8,000 to 16,000 in four cases examined. Its absence in mumps classes the disease as a purely serous exudation in the group with serous pleuritis or articular rheumatism.

TEA.—In spite of the statement recently made by Baron Kamura, Japanese Minister of Foreign Affairs, that America is the best customer of the tea world, one-quarter of the total production of tea in the world being consumed in the United States, statistics show that Great Britain is beyond all question the greatest tea-consuming country in the world. Her consumption amounts to over six pounds per head per year, while in the United States and in Russia the per capita consumption amounts to about one pound; in France to about 0.06 pounds, and in Germany 0.12 pounds. The total consumption of tea in the United Kingdom thus exceeds that of all the countries of Europe together, with the United States added.

LOST TEETH IN HAYMOW.—Humor crops out in spots in the daily experience of the dentist, though the uninitiated is apt to call to mind only visions of "ohs" and "ahs" and involuntary screams from the innocent victim in the chair. A dignified dentist told how his funny bone was struck and he nearly lost a patient by laughing in his face. A typical old German farmer sat patiently undergoing repairs to his maxillary machinery. "How did you happen to lose your teeth?" politely inquired the dentist. "I loscht 'em in de haymow," was the unexpected reply. This brought an outburst of hilarity from the dentist, as the law of association brought before him a vision of the traditional needle in the haystack.

FATALITIES.—Sept. 19, 1902, a twelve-year-old boy at Pittsburg died under chloroform after the extraction of one tooth.—Oct. 6, 1902, a young woman at Minneapolis died suddenly from heart failure. She had been in a comatose condition for two days following the extraction of some teeth by a dentist.—Sept. 28, 1902, a man died from blood-poisoning at McKeesport, Pa. He was an immigrant from Russia, and a few days before, while en route to America, one of his companions pulled an aching tooth with a pair of gas-pipe pincers.—A California millionaire had an ulcerated tooth treated in London some weeks ago, and has been ill ever since. Blood-poisoning followed, and he has had to undergo three operations for abscesses.—Sept. 22, 1902, a young woman at Bristol, Wis., nearly bled to death after the extraction of twelve teeth. A plaster cast finally stopped the

hemorrhage.—Sept. 26, 1902, a professor in Princeton College died from an overdose of chloral hydrate, taken to relieve a toothache.—Oct. 15, 1902, a woman at Columbus, O., had twenty teeth extracted in fifty seconds at a dental college, and died shortly afterwards.—Sept. 25, 1902, a woman at Butte, Mont., died under chloroform, given previous to the extraction of several teeth.

HOME-MADE DENTISTRY.—An interesting incident was told the other day about the second son of the President. They were all seated in church, the children one after the other and their father, the President, at the head, when a tiny hand of one of the sons was seen to twist energetically something from his mouth. He handed it with much pride to his neighbor, one of his brothers, and it was passed along until it reached the President, when a little hand next to him put something into his hand, and the President, with a smile, looked at it and passed it back again. When it came back to the youngster who had sent it, it was noticed that it was a tiny tooth, which he held with much pride, and all was quiet again in their section.

SURGICAL SIGNIFICANCE OF CARBUNCLE OF THE UPPER LIP AND FACE.—James E. Moore (*St. Paul Med. Jour.*) holds that with our present knowledge of this disease we are warranted in the conclusion that the so-called conservative or expectant treatment is applicable only to those cases in which the disease is so situated and is of so mild a character that the natural tendency is toward recovery. It certainly never is indicated when the disease is on the upper lip and face. When in this location the disease is accompanied by a mortality of 50 per cent, and is not to be trifled with. It is the physician's imperative duty to urge early operation, then if the patient or his parents refuse consent the responsibility is theirs. The highest success obtainable is secured by very early diagnosis and prompt treatment, for by this course we save our patient, and the scar is insignificant.

GLYCERIN AS A SOLVENT FOR ANTISEPTICS.—V. Wunsenheim (*Archiv Hyg.*) has recently made a large number of experiments on the question whether glycerin added to antiseptic solutions or used as a solvent affects their bactericidal properties. From his observations he draws the following conclusions: (1) Undiluted commercial glycerin exhibits a bactericidal effect on cholera vibrios, staphylococcus pyogenes aureus, and bacillus coli; (2) in glycerin and water mixtures, B. coli and staphylococcus aureus remain alive longest in those in which the percentage of glycerin is lowest; the effect of high percentages of glycerin in mixture with water appears to differ according to the variety of bacterium used; (3) glycerin solutions of sulphuric acid, oxalic acid, carbolic acid and three isomeric creosoles, creolin, saprol, thymol, formol and tannin, correspond in bactericidal powers with watery solutions of these substances of equal concentrations; (4) hydrochloric acid and acetone in glycerin more so; (5) the disinfectant activity of 1-in-40 carbolic in glycerin-water mixture increases with increased concentration of the glycerin, and in a mixture of equal parts corresponds with the activity of the simple watery solution of 1 in 40. For practical purposes a solution of carbolic acid in pure glycerin should not be a lower percentage than 10, but in a mixture of equal parts of glycerin and water lower percentages than this possess

active bactericidal power; (6) carbolic acid, orthokresol, lysol and kreolin dissolved in glycerin soap solutions are less active than corresponding percentages in simple soap solutions.

RHYTHMIC SUBLUXATIONS OF LOWER JAW AS MEANS TO PREVENT CHLOROFORM SYNCOPE.—Instead of rhythmic traction of the tongue, Valery (*Gaz. des Hof.*) accomplishes the same results by rhythmic sublaxations of the lower jaw, placing the thumbs on the posterior margin of the ramus near the angle and pushing the bone forward and upward between the administration of the drops of chloroform. The rhythmic sublaxations thus induced become more decided as the muscles relax under the influence of the anesthetic. The suspending apparatus of the tongue participates in the movement, and it also aids in the expulsion of mucus. He corroborates the statements of Biousse in regard to the value of the lid reflex as a warning sign in anesthesia, and adds that the existence of keratitis may interfere with this reflex, and its absence should be determined beforehand before trusting too implicitly to it.

IS TOBACCO BENEFICIAL.—So much abuse is being heaped upon the head of Lady Nicotine that one would certainly be guilty of a lack of chivalry if he failed to register the good word that is occasionally said in her behalf. Dr. Dumon claims in a thesis that tobacco is of great use to medical men and those who come in contact with cases of diphtheria, tuberculosis and influenza. He has studied the action of tobacco-smoke upon various organisms found in the mouth, and has come to the conclusion that it greatly retards the development of the germs of the above-mentioned diseases. It has no effect upon the development of the germs of typhoid fever and tetanus. The experiments were made with definite cultures, and Dr. Dumon asserts with positiveness that the vapors of nicotin and pyridin, which are produced by burning tobacco, do render the mouth more or less aseptic. The same observation has been made by dentists.—*Merck's Archives.*

RESTRICTED VISION IN CITIES.—"Speaking of the practice of wearing glasses," said a well-known optician in Canal street, "there is a curious thing about the human eye that the average person is constantly overlooking. We talk a great deal about the influence of color, about glare, and all that sort of thing. Unquestionably color has a great deal to do with the weakness of the human eye at this time. Glare figures as an important factor in the impairment of the human sight. In the matter of color there is so much noting in these latter days that the eye is kept in an almost constant strain. Red is violently red, green violently green, and so on, until the eye is simply strained beyond the normal in an effort to visualize the hue, and hence the optic nerves are in a measure strained and injured. But this is not the greatest danger when we come to think of the modern tendencies so far as the human eye is concerned. There are other conditions which are infinitely more injurious than the matter of color. The glare is bad enough, too. The electric and incandescent lights are simply fearful on one's eyesight. But the thing I guard with more than any other influence is the condition which limits the scope of one's vision. The eye should have a broad range. One should have the opportunity of seeing a long distance. We are denied this opportunity. We are hemmed and hedged in until the distance we are capable of seeing is very short in-

deed. This is why I am a strong advocate of parks, of promenades. Green is naturally a restful color, and if the city could be provided with long avenues and splendid parks, where one's eyes could stretch out in a long vista, it would be a great thing."—*New Orleans Times-Democrat*.

IODOFORM FILLING FOR WOUNDS.—Wounds that form a cavity and defects in bones are treated by Mosetig-Moorhof (*Jour. A. M. A.*) as a dentist fills a tooth. A mixture of oil of sesame, 20 parts; spermaceti, 40 parts, and iodoform, 30 to 60 parts, is melted and poured into the cavity while still warm. It rapidly hardens and fills the cavity completely, bringing the iodoform into close contact with every particle of the tissues. This filling is particularly useful to close cavities in the bones; the tallowy substance is gradually absorbed as new bone is formed. The influence of the materials in the filling is directly stimulating to the tissues, and granulation proceeds more rapidly and satisfactorily than without it. The foreign mass is gradually devoured, as it were, by the crowding granulations. A few cases are described in detail, showing the great benefits derived from this aseptic and antiseptic, stimulating substitute for missing bone or tissues. The filling is sometimes partially expelled by the new tissues forming beneath, in open wounds. The mixture is kept in a bottle inside a thermophor, ready for use. The cavity in the bone may be sterilized with superheated air. In applying the filling to a tuberculous cavity in a long bone, a constricting bandage is applied above, the cavity filled with the mixture, and the constricting band removed after it has solidified. The skin is then sutured over the defect. Radiographs taken at intervals show that the filling gradually grows smaller, while the encroaching new formation of bone casts a normal shadow.

AGES AT WHICH DIFFERENT DISEASES CAUSE DEATH.—Deaths from consumption are divided by ages: Under forty-five, 59%; forty-five to sixty, 20%; above sixty, 12%. Thirty per cent of the deaths from other general diseases—small pox, measles, diphtheria, erysipelas, cancer, diabetes, etc. (which cause in the aggregate nearly one-eighth of all deaths)—occur under forty-five, 36% between forty-five and sixty, and 34% above sixty. Only 12% of the deaths from apoplexy, softening of the brain, paralysis, etc., occur under forty-five years; 33% occur between forty-five and sixty; 55% occur above sixty. Thirty-five per cent of the deaths from other nervous diseases than apoplexy, paralysis, etc., take place under forty-five; 38% between forty-five and sixty; 27% above sixty. Not more than 11% of the deaths from heart disease occur under forty-five; 33% between forty-five and sixty; 56% above sixty. Twenty-nine per cent of the deaths from pneumonia occur under forty-five; 35% between forty-five and sixty, and 36% above sixty. Other respiratory diseases, such as bronchitis, pleurisy, etc., grant a little longer lease of life. From such causes the deaths under forty-five are 24%; between forty-five and sixty, 30%; above sixty, 46%. Thirty per cent of the deaths from some derangement of the digestive system occur under forty; 38% between forty-five and sixty, and 32% above sixty. Only sixteen in 100 of the victims of Bright's disease are under forty-five; thirty-seven in 100 die between forty-five and sixty; the remaining 47% die after completing three score years. Other complaints, classified as genito-urinary,

are old age diseases, 77% of the deaths from such causes occurring at ages above sixty. Fifty per cent of the deaths from violent causes occur under forty-five. Human bodies that have been subjected to the wear and tear of three score years or more are most subject to the kind of breakdowns that puzzle the doctors. Fully 68% of the typhoid fever deaths occur under forty-five; 23% between forty-five and sixty, the remaining 9% at higher ages.—*Insurance Press*.

SUICIDE.—A study is made from the records of his company by Dr. Hanscom of the Royal Arcanum, which brings out a phase of the question little known. In a total death loss of 2,375 in 1901 there were 81 members who committed suicide. The continued losses from this cause incited the company to enact a law that no claim of the estate of a suicide would be paid unless the membership had existed at least five years. By an accurate comparison it was found that this restriction reduced the number of suicides to one-half or one-third what it was when the claims of suicides were paid the same as those of others. It is a strange datum of human nature, this demonstration that a certain number of men thinking of suicide will insure their life prior to doing so. It has been said that married men are less prone than others to commit suicide, but Dr. Hanscom's figures show that 67 married men, 7 widowers and 7 single men committed suicide in 1901. The report is mildly cynical as to the too common verdict of the coroner, "while temporarily insane." "Such verdicts may be excusable in the coroner, as an official who is called upon to perform the duties of both the physician and lawyer cannot be expected to perform either with skill or satisfaction to disinterested parties." In five years the suicidal means employed were by firearms, 182; by poison, 88; by hanging, 43; by asphyxiation, 35; by cutting, 21; by drowning, 15; by jumping from train or window, 4. It is a pathetic fact that of the 81 cases, 23 of the men were at the time of death out of employment and 25 had been in previous ill-health.—*American Medicine*.

MARRIED.—C. A. Atwood, Durand, Ill.; Hattie Louise Waggoner, Janesville, Wis., Sept. 17, 1902.—H. W. Barton, Akron, O.; Maud Elder Sutherland, Ann Arbor, Mich., Sept. 22, 1902.—J. Breeding, Dallas, Tex.; Deane Harris, San Antonio, Tex., Sept. 22, 1902.—J. J. Boyd Covington, Tenn.; Wanda Oldham, Ripley, Tenn., Oct. 1, 1902.—H. G. Butcher, Urbana, O.; Grace Hale, West Liberty, O., Sept. 18, 1902.—Clayton Carroll, Fort Herkimer, N. Y.; Eva M. Edick, Herkimer, N. Y., Oct. 15, 1902.—C. A. Cheney, Fond du Lac, Wis.; Eunice Susan, Fond du Lac, Wis., Sept. 23, 1902.—D. J. Colwell, Jr., Ithaca, Mich.; Harriet Barstow, Ithaca, Mich., Oct. 2, 1902.—L. F. Churchill, Chicago; Bessie Curtiss, Painesville, O., Sept. 15, 1902.—E. J. Driebs, Cincinnati; Theolinda Mangold, Cincinnati, Nov. 5, 1902.—A. L. Fountain, Louisville; Emma Jamison, Salem, Ky., Sept. 18, 1902.—H. Ganson, Nebraska City, Neb.; Gertrude Buffington, Mechanicsburg, O., Sept. 24, 1902.—E. D. Hunt, La Rue, O.; Jessie S. Hobensack, Mt. Victory, O., Oct. 6, 1902.—W. B. Jones, New Berlin, N. Y.; M. Isabelle Benedict, Waterville, N. Y., Oct. 15, 1902.—A. P. Johnson, Chicago; Woodie Davis, Baltimore, Oct. 8, 1902.—Arthur Kidder, Buffalo; Mary Ethel Meecham, Toronto, Canada, Sept. 25, 1902.—Clarence Longfellow, Bellefontaine, O.;

Florence Curl, Bellefontaine, O., Sept. 10, 1902.—A. M. Nehs, Milwaukee; Frances E. Pierce, Darlington, Wis., Sept. 10, 1902.—Herbert Newman, Versailles, Ky.; Alice Land, Lexington, Ky., Oct. 1, 1902.—L. G. Noel, Nashville, Tenn.; Augusta Jonnaid, Nashville, Tenn., Oct. 30, 1902.—E. B. Rhinehart, Schenectady, N. Y.; Louise Lee, North Adams, N. Y., Sept. 24, 1902.

CROSS-EXAMINATION OF EXPERT WITNESSES.—The Supreme Court of Idaho says, in the personal injury case of McLean and wife vs. the City of Lewiston, that one of the assignments of error went to the right of counsel for the parties suing, on cross-examination of a medical witness, to make out his case by such cross-examination. It appeared that a physician was called as a medical expert on the part of the city, and on cross-examination a long hypothetical question was put to him which had been propounded to medical witnesses of the parties suing, and had been answered by them, and the answer of this witness corroborated the evidence of the experts of the parties suing, and served to strengthen it. But the court says that the parties suing did not rely on that cross-examination to make out their case. Under the law a liberal range is allowed in the cross-examination of expert witnesses; and the court does not think that error was committed in said matter. Hypothetical questions, it also holds, must be based on the facts admitted or established by the evidence, or both.—*Jour. A. M. A.*

IT WAS NO USE.—The captain of a down-town Salvation Army corps noticed the other day that one of the most zealous women of his flock had been absent from meeting several times in succession. He sent her a note of inquiry and received in reply the following pathetic letter: "*Dear Captain*—it ain't no Spirrital trouble—praise god, I'm all right there, but it's becaus I got a bad cold & my Nose runs. Now they ain't no use goin' to meeting and praying when youre Nose runs and spoils all youre enjoyment. So Glory to god, good Bye."

CHEERFUL.—Oh, let us all be joyous

While we may,

Though the scientists annoy us

Every day.

For they agitate the topic

Of these creatures microscopic,

Till we're getting misanthropic,

Old and gray.

So now to drown our sorrow

Let us try,

Lest some microbe on the morrow

Should draw nigh.

Let the song and dancing thrill us,

Let's forget that a bacillus

Hopes with all his heart to kill us

By and by.

—*Washington Star.*

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Original Contributions.

CONDITIONS AND CIRCUMSTANCES MODIFYING EXTENSION FOR PREVENTION.

BY JOHN EGBERT NYMAN, D.D.S., CHICAGO. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

The volume and vigor of the discussion of that principle of practice known as "Extension for Prevention" are such that the writer believes interest in it is unabated, and so constitutes this fact his justification for the presentation of this paper.

Careful reading and studying of the published arguments, pro and con, personal observations, experiences and discussions with professional friends have convinced me that there are found carious cavities in the teeth of a nature which demand radical application of "extension for prevention," and others of a nature which suggest and justify a modification of this principle.

In every field of controversy there is a middle ground from which the unprejudiced observer may see the evidence lying on both sides of the line of difference and note that the opposing advocates have each a foundation of facts from which to argue, which has been unnoticed by the extreme partisans of both sides. Could they both be led to meet at this middle point each would realize that the other's belief was justified by his point of view; and could each in turn pass over to his opponent's field and observe, as he sees them, the cases offered as evidence there, it would soon cease to be a field of controversy, for there would be no misconception or misunderstanding to mislead, and an agreement would soon be reached.

Applying this argument to the present controversy, I can do no better than quote the words of that eminently skillful, well-known gentleman, Dr. S. G. Perry of New York: "At the very outset there is always danger of misunderstandings in such discussions as these. This is true to such an extent that I sometimes almost doubt the

wisdom of any discussion that cannot be had directly over the patient, where the exact conditions explain themselves. Then by a single glance all are equipped for a discussion which shall involve no misunderstanding."

Dispute and discussion disclose to the profession the fallacies that exist in a proposition, lead to their elimination, and finally establish it as a logical and approved method of practice or reject it as an injudicious procedure. Could all those who take part do so in the calm, tolerant manner that Dr. Black exhibits these discussions would be desired and encouraged and great good would result from them. As it is, good does result, but for the welfare of the public and the prestige of the profession we should reach a reasonably close agreement as to the method of operating which will give the best results in the greatest number of cases.

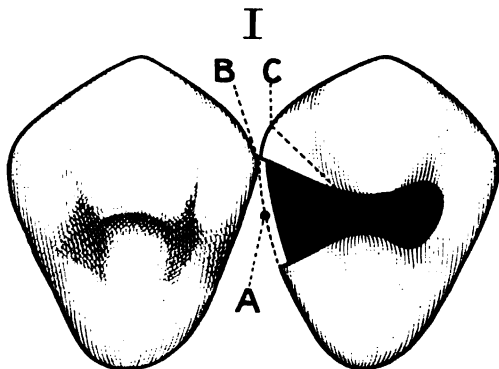
Could both sides examine the filling that had failed, note the characteristics and environment of the teeth, analyze and discuss the cause of the failure; and could both sides examine another filling, similar to the one which failed, which had been successful, and note the characteristics and environment of those teeth, I think they would speedily agree as to the cases which require radical measures and those which justify a modification of these principles.

Since a discussion under such circumstances is practically impossible, the question suggests itself—is it possible to classify and describe the characteristics of the cases above referred to? The writer believes it is and will later endeavor to do so.

A little over a year ago Dr. Ottolengui of New York gave the debate new impetus by inviting several prominent practitioners to discuss the following resolution: "That it is necessary to future safety of carious teeth that the gingival enamel margin in approximal cavities should be extended so as to lie under the gingival gum septa." This Dr. Ottolengui declared to be the dogma of Dr. Black's teachings, and even though it may perhaps be claimed that the text of Dr. Black's articles do not warrant such a statement, as it infers that he has decreed all gingival margins, without exception, must lie beneath the gum septum, while the text of his writings does not so state—it cannot be denied that even if Dr. Ottolengui erred in this inference, so too has probably the majority of the profession, and so Dr. Ottolengui was justified in the declaration. He was justified still further by the recent statement of Dr. Black, that had he fore-

seen the widespread consideration which would be given this practice of extension for prevention he would have even more carefully chosen the words to express his views. If the discussion which Dr. Ottolengui's declaration provoked has dispelled widespread misunderstandings—as I believe it has—then he was justified in his declaration, even though it was based upon a misapprehension and a misunderstanding.

That he was sincere is shown by the fact that he submitted his argument for the negative to eight gentlemen, four of whom he thought would oppose his views and four of whom he thought would agree with him, before he gave them to the society they were to



be presented to or published them in any journal; and still more by the fact that he gave these gentlemen time to prepare their arguments, favorable or antagonistic as they might be, and to submit them to the society at the same time he presented his, and then published them simultaneously in the same journal. For this the Doctor is to be commended in the heartiest manner. The discussion was interesting and some portions of it were quite amusing.

Dr. Ottolengui was unfortunate in his choice of the word "dogma" in characterizing the principles of Dr. Black, for while it is true that the lexicon defines it as "that which is held as an opinion, a tenet, or a doctrine," it also defines it as "a principle or a doctrine that is asserted or taught without sufficient evidence to warrant it," which latter is the popular meaning of the word, and no one can truthfully say that Dr. Black in all his career has ever advertently done any such thing. This unfortunately injected into a scientific

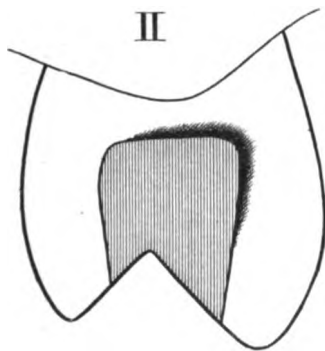
discussion a sentimental factor which evidenced itself in the fervid argument and blunt language of Dr. Wedelstaedt's reply. However, I think the use of this word in that respect may have been unintentional.

Dr. Ottolengui stated many things which were true, but erred most grievously when he said: "Then again in mouths superabundantly supplied with saliva, whatever the temptation to fill the small approximal cavity in the lower molar, our conscience would not permit us to thus save labor, for it is in the fluids of the mouth that the germs of decay propagate, and consequently *the more saliva the more rigid the need for extension for prevention.*" I wonder that he did not correct that statement when he saw it in print, for he surely cannot be ignorant of the fact that *it is the quality and not the quantity of saliva that is the modifying factor in the propagation and operation of the germs of decay.*

Again he asks: "Can a part of a tooth be cleansed without resort to a tooth-brush by the tongue and lips and by the food itself during mastication?" Replying in the negative to this question, he says: "To dispose of the last proposition first I need only remind you that when a person eats on one side exclusively it is the *opposite* side of the mouth which is slimed with filth." The inevitable inference is that the teeth on the side upon which one eats are not found so "slimed," and therefore unwittingly the Doctor has offered an argument in the affirmative upon this question. Furthermore, his statement that "eighty per cent of the failures noted by me have been where the gingival border was under the gum tissue," does not accord with the observation of a large majority of practitioners, for it cannot be denied that one of the regions of the greatest relative immunity is that lying beneath the free margin of the gum.

I fully agree with Dr. Ottolengui when he says: "A cavity filled as he (Dr. Black) describes, with the gingival and other extensions as he directs, the filling being absolutely perfect, when completed would be as reasonably immune from decay as the hand of man could make it." Also further on when he says: "I have admitted that the cavity shape suggested by Dr. Black may be applicable to large cavities;" and again when he says: "The moral is that it is not the mere placement of the gingival enamel margin which will assure immunity; it is needful that the filling after insertion shall be perfect and thoroughly finished."

However, I disagree absolutely with Dr. Ottolengui when he states: "Extension with me rigidly involves all caries or enamel that may be called infected, but it goes no further and seeks no imaginary lines of immunity which, to my mind, do not exist." I have noted many cases in which a portion of a sulcus was uninfected, yet I am sure the Doctor would not insist that there was no necessity for cutting out the remainder of that sulcus and including it in the cavity. Again, I have seen some cases of compound cavities which started at a point of structural defect perhaps two millimeters distant lingually from the contact (Fig. 1—A), and after removal of all carious and infected dentin the buccal margin was exactly at the contact point (Fig. 1—B). No conscientious, scientific operator



would think of filling that cavity with the margin in that position, but would extend it buccally one or two millimeters (Fig. 1—C) to prevent occurrence of caries at the most susceptible point—that of the proximal contact.

Dr. Johnson's reply was characteristic of that impartial, logical man. He agreed that in some cases radical extension was uncalled for, but that much depended upon the position of the interproximal gum septum, the condition of the mouth and the age of the patient—circumstances which Dr. Ottolengui had entirely ignored in his paper. He also called attention to the use of gutta-percha for separating the teeth and forcing away the gum from the region of the cavity in the preliminary treatment of it, thereby eliminating many of Dr. Ottolengui's arguments as to the inapplicability of this method.

It is evident to one who studies this matter carefully that the men

of the East are not familiar with the detailed technique of the men of the West in the preparation of cavities and the finishing of fillings, the gingival margins of which lie beneath the gum.

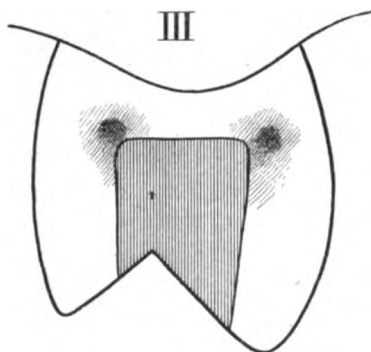
Dr. Darby's reply was splendid and I am sure will be universally indorsed. Especially is this true of the statement in which, after deprecating the use of the term "self-cleansing," he says: "If Dr. Black had said—carry the margins to a point where the tooth-brush would reach and clean the borders, nearly all would agree with him, because decay often recurs from insufficient extension." Also in this statement: "I should not deem it wise to cut away the whole approximal surface of a bicuspid or molar because it was defective at a minute point; but if that tooth were poor in quality, and decay were progressing rapidly, I should view it differently and cut as freely as they have dictated."

"Dogma"—that word—struck to the heart of Dr. Wedelstaedt, and his emotions are reflected in the fervor of his reply. It is evident that when he says: "Three or four cuts of a chisel will more often than not place the margins of these cavities on the proximal surfaces of the teeth into territories that are absolutely self-cleansing, and three or four cuts of a large Wedelstaedt hoe will so extend the cavity at the gingival margin that when the filling is completed it will be covered with a healthy gum margin"—he refers to large cavities which would probably be extended in similar manner by Dr. Ottolengui himself. While in small cavities, where extension below the gum and to "self-cleansing" (or the axial) lines bucco-lingually means extension through two millimeters or more of sound tooth structure, I doubt the ability of any man to accomplish this by three or four strokes of any instrument in each direction. Nor can I accept as convincing his evidence gathered from examination of fillings in extracted teeth, especially those which are of amalgam. His sarcastic remark that Dr. Ottolengui "knows absolutely nothing about scientific preparation of cavities," that "he is twenty years behind the times," is to be deplored. Ridicule never converted any man and should not be employed in a scientific discussion, except a last resort to discredit a man whom you do not believe to be sincere.

The reply of the man whose teachings were assailed, Dr. Black, was calm, tolerant, dignified, indorsing that which was said by his intimate friend, Dr. Johnson, admitting that circumstances and conditions sometimes justified a modification of his principles, explain-

ing some things that seemed to be misunderstood, and reiterating his faith in the essentials of extension for prevention.

A further instance of the misconception in regard to this matter by those of the East may be noted in a paper on "Extension for Prevention" recently submitted by Dr. Geo. S. Allan of New York. It is a general protest against the practice, without any specific argument. It is evident from the report of the discussion that the Doctor illustrated his idea of what extension for prevention means by drawings upon the blackboard, and it is to be regretted that the drawings were not reproduced when the paper was published, for then we would know whether his conception coincided with ours or not and could base our discussion accordingly. The Doctor's statements



were at times contradictory, as when he refers in one portion of his paper to this "new movement" and "this new method," and a little later he says: "These methods of shaping cavities are modifications only of the old." It is somewhat amusing to be invited to consider whether "an immune period of decay may not recur and thus do away with the necessity of extensive cutting." "An immune period of decay!" That is about as paradoxical as "a cold fire" or "a warm cake of ice."

It is evident that there is dissension among the ranks of the opponents of extension for prevention, for Dr. Allan states that the large extended cavities are easier to fill than the small unextended ones, while Dr. Ottolengui maintains that the opposite is the case. Dr. Gillett's discussion demonstrates that Dr. Allan has an exaggerated misconception of this matter, for he states that he "doubts if the gentlemen quoted to-night, with the possible exception of

one (with whose methods I am not sufficiently acquainted) once in a thousand times make such extension in a bicuspid as Dr. Allan drew on the board"—a statement indorsed at the same meeting by Dr. T. E. Weeks of Minneapolis. Dr. Allan closed his discussion by characterizing one of our most rational, considerate operators, Dr. Johnson, as a most extreme man, and attributed to him a statement that he never made, namely, that the men of the East who did not practice extension for prevention were twenty years behind the times. Such inaccurate quotations must cease or we shall drift still further apart.

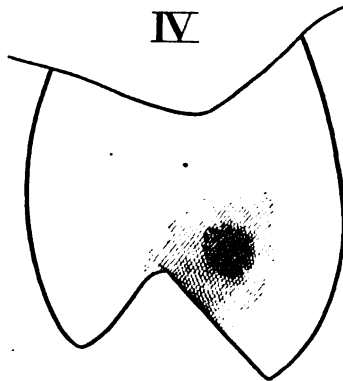
These instances decisively demonstrate that the disagreement is due very largely to misconception and misunderstanding. After all, it seems probable that while scientific, skillful dentists of the East differ decidedly from those of the West in theoretical discussion of cavity preparation, they differ less in actual practice. I think it unfortunate that the term "self-cleansing" has been used, as it implies an acquiescence on the part of the dentist to the patient's neglect of his teeth, and has probably done much to arouse the antagonism shown.

The Point of Dispute.—The great point of dispute is whether fillings fail because of faulty operating or because of neglect to extend margins beneath the gum and to the axial lines of the teeth. While no doubt many fail from the latter cause, I believe that the majority of failures are due to faulty operation.

Expectant Treatment.—I cannot conceive that it is the duty of the dentist to so operate that in the future a patient may disregard even ordinary cleanliness, and may neglect to give his teeth the daily attention that he bestows upon his hands, face and hair, without eventually suffering the natural penalty of such neglect. We have a mission as educators as well as operators. Therefore I cannot but feel that the operator in the ordinary cases of a private practice has done his full duty when he has extended his margins buccally and lingually to a point removed to a degree from the contact point and readily accessible to the toothbrush, even though they may not be extended to the lines regarded as self-cleansing. A man slovenly enough to leave the cleaning of his teeth to the food he masticates should be allowed to suffer the consequences. Nor can I feel it our duty to operate radically when present conditions do not indicate it, because in the future there may possibly be a recurrence of susceptibility. If the

factor of prophylaxis is deemed by one to be of such importance, then it becomes the duty of such an operator to cut out all proximal contacts and replace them with a material which carious processes cannot affect, for it must be admitted that should susceptibility ensue these are the points of greatest liability to caries and the ones most likely to be attacked.

Susceptible and Immune Surfaces.—Certain areas of a tooth are regarded as susceptible to decay and certain others are regarded as immune, this susceptibility and immunity being due to the anatomical situation which favors the retention of debris of food and stagnant secretions of the mouth; in other words, parts difficult to keep clean



because of their inaccessibility, such as the pits and fissures of the buccal and occlusal surfaces and the smooth surfaces of the enamel at the contact point. The area in the immediate vicinity of the gum margin, including the entire circumference of the tooth, is also susceptible to that curious form of decay known as "gingival caries," in which a zone of decay develops completely encircling the tooth in a zone just above the gum margin. It may be that this latter form of decay is due to the fact that the gingival secretions in periods of deranged function become so altered as to offer especially good material for the formation of gelatinous plaques.

Other surfaces are regarded as immune because of the fact that they are accessible to the toothbrush and are also cleansed by friction, by the tongue and cheeks, and by the food during mastication, or by the chewing of any substance, such as gum, while the region below

the gum is regarded as immune because of the protection offered by the gum margin.

There is no discussion regarding the susceptibility of pits and fissures or the region immediately at the contact point, but there is considerable discussion as to the area of susceptibility about the contact point. This area varies according to the shape of the teeth, the structural condition of their surfaces, and their relative position (in other words, their proximity to one another), and the position of the interproximal gum septum, it being a much larger area in some cases than it is in others.

On teeth of great contour in normal position, with the gum septum either close to the contact or removed a considerable distance from it, and in mouths containing thin, clear saliva, it is a much smaller area, comparatively, than upon teeth of little contour in normal position with the gum septum removed a little from the contact. The difference in the size of the susceptible area is still greater if these latter teeth are in abnormal position or are in mouths containing thick, turbid saliva.

In regard to immunity—of course, strictly speaking, no such thing exists upon the surfaces of teeth. The writer has noted primary caries upon almost every surface of the crown of a tooth, even upon the cusps and along the axial lines. Therefore this term is used in a relative sense as referring to regions of the least susceptibility.

Dr. Black has recently made a sharp division in regard to cavities found upon the smooth surfaces of the teeth adjacent to a compound filling, which admits of more coherent discussion of the subject than was possible formerly:

First. Cavities due to a faulty filling, which have their inception directly between the margin of the filling and the margin of the cavity, and open up a crevice along that margin. (Fig. II.)

Second. Those in which the inception of caries occurs at a point outside the margin of the filling and extends to and involves the filling only after extension in the course of time. (Fig. III.) Upon this second class of cavities Dr. Black bases his argument for extension of cavity margins through sound tooth structure.

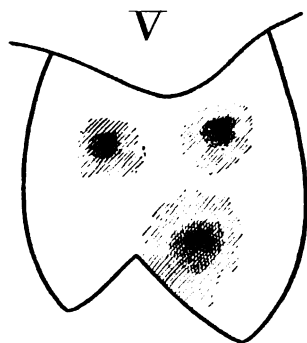
Caries found in the enamel surface adjacent to a filling, the nucleus of which is without the margin of the filling (or not between the filling and the cavity wall) and which involves it only by extension in the course of time, is *primary caries*. (Fig. III.) This is occur-

rence and not recurrence of decay. Such regions therefore must be well-nigh as susceptible to caries as the region at or near the contact point, and the advisability of the extension of the margins so as to include these regions within the cavity must depend upon the percentage of the cases observed in which caries is found at or near the contact point alone. (Fig. IV.)

Those in which two or more smooth surface cavities are found co-existent but independent of one another, one of which is at the contact point. (Fig. V.)

Those in which a smooth surface cavity is found in the region regarded as susceptible, without caries at the contact point. (Fig. VI.)

Those of the third class (Fig. VI) are identical with those in a



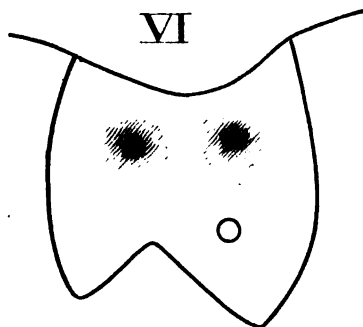
region near a proximal filling (Fig. III) and logically must be found as often in one case as another. I do not know that a definite numeral value has ever been determined for the terms "rare" or "frequent," or for that phrase, "negligible quantity," by which is meant a quantity so small that it is not considered a factor of any influence and therefore may be disregarded in the consideration of a problem. Could we agree upon the numerical value of these terms and this phrase, and would competent observers record and classify all cavities coming under their observation, the percentage could soon be determined, and if it were so low as to be considered a "negligible quantity," or so high as to be considered a factor of importance, our duty as to extension would soon be determined beyond logical controversy.

Evidence.—All rational discussion must be founded on facts, therefore our arguments for or against this practice must be founded upon evidence, and for a brief moment I wish to speak of some varieties

of evidence which have been submitted which are not reliable. The evidence found by examination of fillings in extracted teeth is circumstantial, so to speak, and of a character open to doubt, for to be certain of the correctness of the conclusion drawn as to the cause of the condition observed one must know what was the shape, position and condition of the proximal tooth when this extracted tooth was in the mouth. In other words, *you must know what the environments of this extracted tooth were before you can definitely diagnose the cause of the condition observed*, and if you do not know what they were the correctness of your conclusions, whatever they may be, is open to grave doubt. For instance—we will suppose that a good operator has put in a perfect compound gold filling in the distal surface of the second bicuspid, that is perfectly adapted, contoured and polished, so far as perfection is possible; but has not extended the gingival margin beneath the gum because there was a millimeter of sound tooth structure above it which at that time he did not deem necessary to remove. Some time later the mesial surface of the adjacent molar became carious. The process was slow and the cavity was neglected. Gradually the contour was lost and the tooth driven forward closer to the bicuspid until the contact was finally removed to a point at or near the gum margin. (A, Fig. VII.) Then, owing to discomfort or pain, the individual has, for some reason, applied to another dentist, who is a careless operator and simply fills the cavity without separation, without contouring the filling, and probably without properly polishing it, leaving the contact point as he finds it, at or near the gum margin.

It is certain that caries will recur at that abnormal contact point and that a cavity will in time under ordinary conditions develop in the sound structure gingivally and to either side of that gold filling in the bicuspid. Were that bicuspid extracted and examined it would demonstrate the typical claims as to caries developing in sound tooth structure around a gold filling thought to have been good because put in by a good operator, because of failure to extend the cavity margins so as to include that area. However, could the examination be made before extraction, and the environment noted, it would be evident that the abnormal contour of the proximating surface and the abnormal point of contact were responsible for the caries about that filling. *So evidence to be positive, exact and reliable must be gathered from cases in the mouth when all the environments may*

be noted. Furthermore, unless the examination be made a short time after caries has developed there will be so much loss of tooth structure that it will be impossible to definitely determine whether caries was due to a faulty filling and developed first between the tooth margin and that of the filling, or whether the filling was perfect and caries began upon the surface outside the filling and extended to it as the cavity developed. The shape of the cavity of recurrent caries, after it is fairly developed, does not accurately indicate the exact initial point of decay, for the carious process does not extend the cavity in a symmetrical manner, and we must know the exact initial point of decay if we are ever to arrive at definite conclusions in regard to this matter.



The discovery of the instability of amalgams renders the evidence gathered from observation of conditions about such fillings absolutely valueless for the discussion of extension for prevention, and such evidence should never be presented as a demonstration for either phase of the controversy, unless one knows what amalgam was used, how it was manipulated, and the manner in which it was inserted.

Nor do I believe that from observations in infirmaries one can formulate principles of operating which are applicable to private practice, as the conditions found in the two places are vastly different. The majority of infirmary patients are uneducated, of a low order of intelligence, live amid more or less unclean environments, and have developed careless, unclean habits, which it is simply impossible to induce them to correct, even though you may clearly illustrate the evil results which follow therefrom, for it seems out of the question to make them appreciate even common-sense advice couched in the

plainest language. Many of them live a hand-to-mouth existence and have always regarded a toothbrush as a luxury and not a necessity, while the keeping of body and soul together necessitates long hours of hard labor and their spare moments are barely sufficient for food and sleep. For these poor souls radical extension for prevention is probably necessary to protect them from their habits, and anything less will fail of permanent results.

After all, this whole question is one of cleanliness, for a clean surface from which deposits of all nature are removed by constant friction, no matter from what source, does not decay.

Nor is the fact that a gold filling was inserted by a good operator absolute proof that it was a perfect filling, for the best of operators are but human and therefore liable to err. Under the mental and physical stress accompanying a busy practice one's muscles will tire, his brain grow weary, his eyes weaken, his fingers lose their skill, and he will be below par mentally and physically for an hour or two, or perhaps a day—and so will his operations, without his being conscious of it.

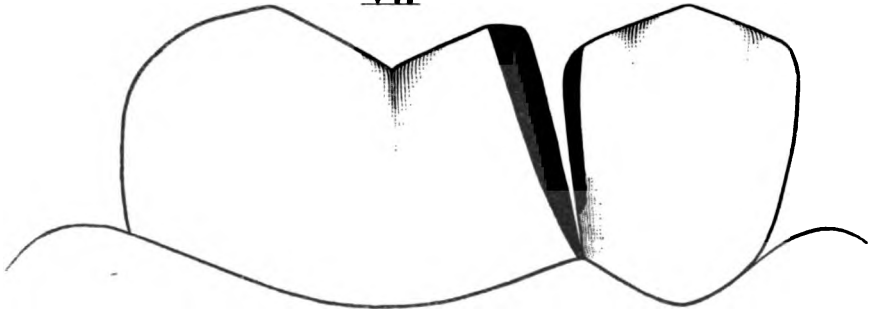
Cause of Failure.—It seems to be an established fact that caries about a compound filling develops most frequently at the gingivo-buccal and gingivo-lingual angles of the margins, and I cannot help feeling that this is due in many cases to an unnoticed injury to the enamel in this region by the beaks of a separator, so I am opposed to their general use and but seldom employ them. Do not infer from this that I do not appreciate the necessity of obtaining space for operating, especially in regard to contouring and finishing. I do appreciate it and do obtain it—but seldom, however, by the application of separators. I also believe that a large number of failures observed at these angles has been due to the fact that it has been largely and is yet to a degree the practice to cut deep grooves or pits at these points for the anchorage of the filling. This almost invariably leaves a section of enamel without its *natural* and *necessary support*—the dentin (E-E, Fig. VIII)—and it is very likely that the wedging of the gold into the pit or groove and between the dentin and the unsupported wall of enamel either checks the latter throughout its thickness or else weakens the cohesion of the enamel prisms. Even if the gold is packed without these injuries to the enamel, still that section of the enamel has been placed in an abnormal environment; its natural support has been replaced by a material of different physi-

cal properties and of an altogether foreign nature, and it has been cut off from the serous moisture of the dentin.

It is quite logical to believe that under these conditions the cement substance of the enamel (or its organic matrix) degenerates until it no longer firmly binds together the enamel prisms, and that that enamel section loses its resistant power, a condition develops which permits infiltration, and thus it becomes extremely susceptible to caries.

Finishing of Fillings.—I believe that oftentimes the careless finishing of fillings at these points leaves the enamel surface in the immediate vicinity in a rough, scarified condition, and thus renders these

VII



regions much more susceptible than they would be were they well polished.

Small and Medium Fillings.—It is admitted that small and medium fillings have sometimes permanently maintained their integrity and preserved the tooth in which they have been inserted. It has been asserted that this has been due simply to the fact that shortly after their insertion a period of immunity ensued and made their permanence possible; that the cavity would not have increased had it not been filled at all.

Of course, we know that there are cases of arrested caries, even where the process has progressed to the formation of a cavity, in which decay suddenly ceases and there is no more loss of tooth structure from that cause. Also other cases where a filling has been dislodged shortly after its insertion and has never been replaced because there was no pain arising from the loss, and despite the fact that it is an ideal spot for the collection of debris and an ideal habitat

for bacilli, safe from disturbance by the toothbrush, the floss or the toothpick, there is no extension of the cavity from recurrence of decay.

Of course these cases corroborate the previous statement about small and medium fillings, and indicate absolute immunity despite physical defects of the teeth—an exceedingly rare condition. But this view the writer does not indorse, for these cases are very few compared with those cases in which we find small and medium fillings in perfect condition and performing their service of preservation of that surface of the tooth in which they are placed, while caries has attacked the specially vulnerable regions of other teeth in the same mouth, and progressed rapidly unless interfered with, refuting the correctness of the aforesaid statement and demonstrating that there are other reasons for the success of those fillings than general immunity of the mouth. This condition may be noted in the mouth of the writer and in the mouths of a number of dentists of his acquaintance in Chicago.

It is my belief that if caries is found along the cervical or at the bucco-lingual angles of the cervical margin of a compound proximal filling, and is of such character that the cause is not clearly indicated; the condition of the proximal contacts of the teeth in the immediate vicinity, providing they have no compound proximal fillings, is an index to the cause. If they are intact the caries is probably due to faulty filling, but if the contact points are also found to be carious, then the decay about the proximal filling may have been the result of insufficient extension.

Many men have contended that it has not always been necessary to extend the margins of small or medium cavities so that the gingival margin shall lie beneath the gum septum and that the width of the cavity shall be two-thirds the bucco-lingual diameter of the tooth, and the advocates of extension for prevention, including Dr. Black and even Dr. Wedelstaedt, have admitted that there may be cases justifying a modification of this principle.

But the consideration of these cases has been limited to a mere statement to the effect that they are found. The writer feels that these cases are too numerous for such scant consideration and merit a classification and description that will bring them to the attention of the profession. Now, to attempt to state the circumstances and conditions having a modifying influence upon the position of the cav-

ity, first stating that all statements and arguments thereupon relate to extension through sound tooth structure and the insertion of permanent fillings. To my mind the modifying conditions and circumstances are as follows:

The age, condition, and habits of the patient.

The shape, location and condition of the teeth.

The position of the interproximal gum septum.

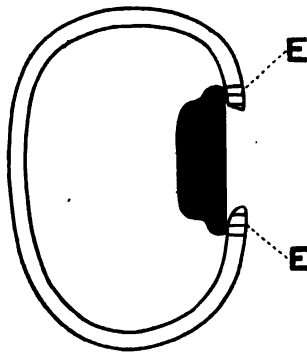
The position of the cavity.

Esthetic considerations.

General condition of the mouth.

These factors must be studied until judgment is acquired to differentiate the cases and base the operative procedure accordingly.

VIII



Again, is necessary that talent of judgment, the possession of which makes some men great and successful, while the lack of it makes others insignificant failures.

The Condition of the Patient.—If the patient be of that peculiar nervous temperament, emotional and hysterically inclined, which exhibits strong reflexes from pain which are beyond his power to control; if it is evident that the patient has but a limited amount of mental and physical endurance; if it is thought that the ordeal of radical extension will cause him so much suffering that in the future he will shun the dentist and neglect his teeth because of his dread of a similar experience—I believe one is justified in modifying, even to a large degree, this practice of cavity extension, especially if the patient be an intelligent person who can be induced to carefully clean the teeth after every meal. Dr. C. N. Johnson has summed it up

splendidly: "We are never justified in breaking down the nervous system of a patient by the blind following out of some heroic theory."

Furthermore, much depends upon the frequency and regularity with which a patient presents himself for inspection by the dentist.

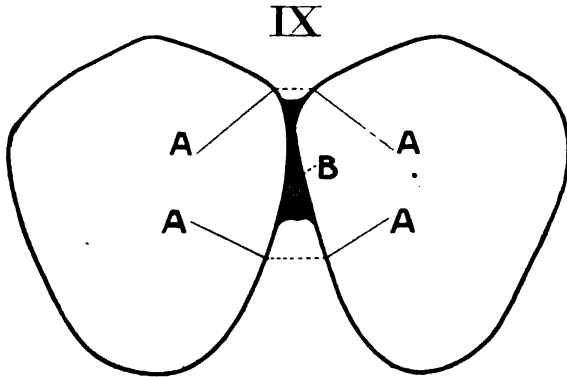
Age of the Patient.—As a rule, in patients above the age of forty the periods of probable susceptibility have been passed, and one may modify these methods without fear of unfortunate results. In patients ranging from fifteen to twenty-five years of age, in whose mouths are found numerous evidences of great susceptibility, it is probably wise to practice full extension in proximal compound cavities in the bicuspid and molars, if it be deemed advisable to insert permanent fillings, as the probabilities are that the period of susceptibility will continue for from seven to ten years at least. In middle life the operator may be governed by circumstances and conditions which will be discussed a little later on.

Position of the Cavity.—If the cavity be in the mesial side of the first bicuspid there is not the necessity for extreme extension buccolingually that there is in cavities upon the distal side of the second bicuspid, for the reason that the cuspid is always a much narrower tooth than the first molar, and the bristles of the toothbrush will reach much nearer to the contact point than they will in the region between the second bicuspid and the first molar. Cavities in the distal half of the first bicuspid and the mesial half of the second bicuspid may be given an extension which will be an average between that used on the mesial half of the first bicuspid and that on the distal side of the second bicuspid. The same is true of the mesial half of the first molars in comparison with the distal surface of the same tooth and the mesial and distal surfaces of the second molar.

Esthetic Considerations.—In regard to the anterior teeth, I cannot reconcile myself to extension for prevention as practiced by its enthusiasts, unless it occurs in the removal of carious or infected tooth structure. I should prefer to spend the time that would be occupied in such extension in convincing the patient that if he would take strict care of his teeth it would not be necessary to cut away a great deal of the tooth structure which was not decayed. I should prefer to take my chances of being obliged to refill a tooth within from three to five years' time, if it should be necessary, than at the time to so operate for a patient that he would be disfigured so long as that tooth remained in his mouth. I cannot regard the display of metal in the

anterior teeth as anything less than a hideous disfigurement, and I cannot but believe that the majority of patients would be willing to take their chances of temporary preservation, with natural beauty of the teeth, to the certainty of permanent preservation with lasting disfigurement. Especially is this true in the cases of women and children. Happily, the development of the porcelain inlay has met many of the esthetic objections.

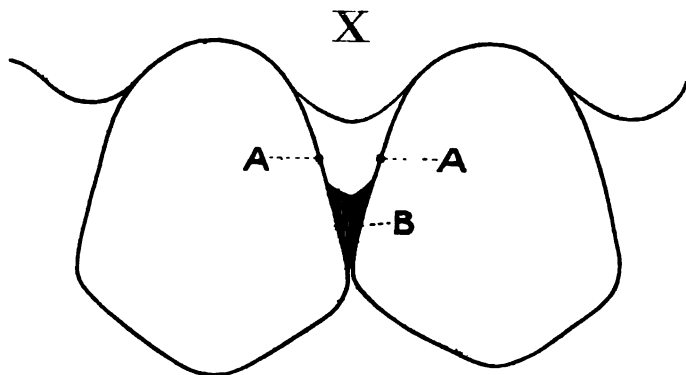
Shape, Location and Condition of the Teeth.—If the teeth be of marked contour, so that a lateral section of the teeth, that is, molars and bicuspid, at the contact point shows marked convexity; if the lines of the proximal sections diverge markedly and rapidly from the contact point (Fig. IX); and if the same thing were true of a longi-



tudinal section through the same point (Fig. X), the extension of cavity margins need be carried but a short distance from the contact point in any direction, for at but a short distance (AA-AA, Figs. IX and X) from the contact point will be found space enough for the entrance of the bristles of a toothbrush, and the divergent tooth walls are so far apart that stagnant secretions will not be held by capillary attraction in contact with the tooth structure (B, Figs. IX and X). This area of capillary attraction will also depend upon the consistency of the saliva. In short, in teeth whose longitudinal section and latitudinal cross section at the contact point show but slight convexity, and whose proximal lines diverge slowly and slightly from their juncture at the contact point (Figs. XI and XII), it is essential that full extension should

be made, for it will be necessary to extend to a point where the amount of divergence is sufficient (AA-AA, Figs. XI and XII) to permit the entrance of the bristles of a brush, and too great for the operation of capillary attraction (B, Figs. XI and XII).

In irregularities of the teeth it is often the case that instead of there being a contact point there is a contact surface of considerable area, and if you have not the opportunity to correct the irregularity and obtain a natural contact, you must extend the margins of the cavity radically to obtain readily accessible margins. While if there be any physical defects not of a carious nature in a region near the cavity, it should be included within the cavity, even though at the

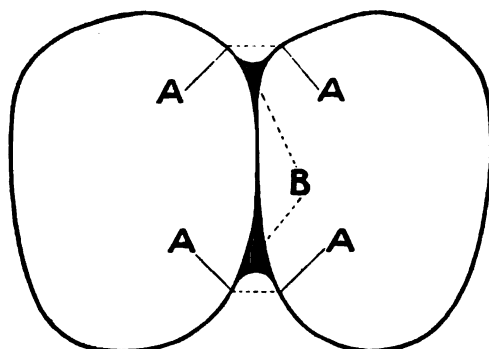


time of operation it may be in sound tissue. If on account of a physical defect caries develops at what is usually the contact point, but there is a definite space between that tooth and the adjacent one, there is no need for extension beyond that due to the removal of infected structure.

Position of the Interproximal Gum Septum.—This, and the shape and position of the teeth, are the most important factors in the problem of extension of cavity margins. The septum of the interproximal gum may be found anywhere from the contact point to a point from one to two millimeters above the enamel margin of the crown of the tooth. Frequently it extends completely to the contact point and entirely fills what would be the interproximal space, so that no space is there. Of course, under such circumstances there cannot be any preparation of a cavity, which shall accomplish the removal of the carious and infected tooth structure, that does not carry it below the

gum margin. Whereas, in teeth of marked contour, where the gum septum lies from two to four millimeters below the contact point, there is no necessity, if after the removal of all carious tooth structure there remains from one to two millimeters of sound tooth structure, of extending that cavity below the margin of the gum. Nor do I believe in extending the gingival margin below the enamel line when the gum margin lies below it, unless it is absolutely necessary to do so in removing carious tooth structure, because of the fact that such a procedure leaves two points on the buccal and lingual sides which it is practically impossible to finish so that they will not offer a lodgment for particles of food. It is true, however, that at the age at

XI



which proximal caries is most frequently found the gum septum lies close to the contact point, and nine times out of ten the removal of carious and infected dentin has placed the gingival margin below the gum.

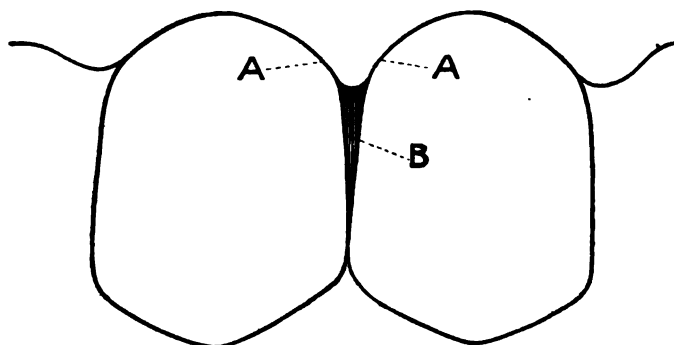
General Conditions of the Mouth.—If there are found only isolated cavities in peculiarly susceptible localities—if the saliva is clear and of thin consistency—if the patient is robust and enjoys constant good health—if the soft tissues are normal—if the patient has been obliged to have but an occasional filling inserted during the past years—if there are in the mouth compound proximal fillings whose margins were not extended, which are in perfect condition after the lapse of a number of years—then we are justified in very slight extension.

But, if the mouth shows signs of persistent susceptibility through a number of years—if the patient be subject to catarrh and the soft tissues show signs of an inflamed condition—if the saliva be turgid

and of a thick, ropy consistency (for the thicker and more turgid the saliva the greater the area of capillary attraction and the greater the area of susceptibility)—if the patient has been obliged to have fillings inserted at frequent intervals in the past—if compound proximal fillings which seem from general appearance to have been skillfully inserted and finished, but whose margins have not been extended, have failed in a comparatively short time—then we should extend more radically than under conditions previously mentioned.

One will find after studying the question that in this, as in many others matters, "Circumstances alter cases." In a word, extend your cavity margins to accessible lines, to lines beyond the area of capillary retention of stagnant secretions, so that a perfect filling can be kept

XII



clean, and you have done your duty to your patient, for you will not have unnecessarily sacrificed sound tooth structure or caused him needless pain. So I advocate strongly extension for accessibility—that is, accessibility to the toothbrush. And I also strongly advocate that we discontinue the use of the term "self-cleansing."

After all, I cannot but feel that perfect manipulation is perhaps even more important than radical extension; for the latter will not avail, nor can cleanliness be maintained, unless a perfect filling is inserted, and a perfect filling will not avail unless cleanliness is maintained. I cannot believe that no matter how perfectly a filling is placed, contoured and polished, it will fail if the margins are not extended buccally and lingually two-thirds the diameter of the tooth and gingivally beneath the gum septum, unless there is permanently a condition of immunity in the mouth.

I believe that cavities of the character I have described, prepared after methods of Dr. Black and Dr. Johnson as regards seating, anchorage and beveling of margins, without undercuts or pits leaving sections of enamel unsupported by dentin, and filled after their methods of adaptation, condensation, contour and finish, will be successful even though the preparation does not include radical extension for prevention, if the patient makes careful use of the toothbrush daily.

In conclusion, unnecessary removal of tooth structure is unjustifiable from any point of view, and adds to the woes of the operator as well as those of the patient. Therefore, in the endeavor to save both from unnecessary pain and fatigue—in the endeavor to enlighten operators who apparently cannot recognize the cavities justifying modification because they have never been described to them, and have indiscriminately radically applied this principle—in the endeavor to convert those who, because they misunderstood this one detail of Dr. Black's teachings and could not believe that in certain cases its application was essential, refused to believe in him or his teachings at all, refused to apply the principles he has expounded in the many cases in which they are eminently the principles to apply, and have withheld from him the full measure of gratitude and praise that his labors and contributions to our science merits—in the endeavor to reconcile sincere men, North, South, East and West, this paper has been written.

Discussion. *Dr. E. H. Allen, Freeport:* I heartily agree with the views of the essayist, so there are only one or two points that I would bring up. In the proximal cavities of bicuspid and molars it has been my practice for a number of years to carry the margin of the cavity to the point of accessibility, so that the margin may be kept clean with a toothbrush. I would not often extend the gingival margin so that it should be covered by the gum septum unless caries had invaded that territory. I agree with the essayist that Dr. Black has been misrepresented, and I further agree that radical extension should not be carried out on the anterior teeth. As regards immunity, if I had to deal with a cavity in the proximal surface of a bicuspid or molar, and it appeared that the patient was practically immune from caries, I would extend the margin to the point of accessibility because the fact that he is now immune does not warrant the supposition that he will always be immune; also, it is diffi-

cult to prepare a cavity in the teeth referred to for a small filling, and finally, it would not be a contour filling, but would either give a flat surface or be like a little bump. The essayist is right regarding instructions as to cleanliness, for to give same is one of a dentist's first duties. I think that a mechanical separator is a thing of torture, and I believe that decay often recurs just where the jaws of the separator have injured the enamel and made it possible for bacteria to gain a foothold. In polishing a filling coarse disks or strips are apt to make deep scratches, and a ridge may be cut at the gingival margin without your knowing it, so great care should be taken with the margin.

Dr. G. V. Black, Chicago: It is exceedingly difficult with this and other subjects for us to understand each other and the expressions used. I am misunderstood because my language has not conveyed to others the thought that was in my mind. I have been misunderstood in this—that cutting for access, shaping for strength, etc., have all been attributed to extension for prevention. With reference to the incisors, I can hardly imagine an ordinary case where I would show the gold filling, especially in cutting for extension for prevention. I would show it much more in cutting for access, but where I have shown gold to any extent upon incisors it has been because the enamel was undermined and too frail to leave. What does extension for prevention mean in this particular case? It means simply squaring out the normally round cavity of decay toward the bucco-gingival and linguo-gingival angles. There is occasionally a case where the cavity has occurred some distance from the contact point, or the latter has been some distance from the incisal edge, where we must extend incisally in order to properly place the contact point, but in this case extension for prevention should not mutilate the tooth. Here then is a confusion as to what cutting should be attributed to the principles of extension for prevention. In any study of this subject we must have in close relationship a study of caries and its ways of attacking the teeth, remembering that extension for prevention is intended to prevent subsequent attacks, so the extension should be in lines always only where this reattack occurs. This reattack is not upon the labial surface of incisors nor along the angle of same. It will be near the gingivæ in the central portion of the labial surface and not upon the angle. If you will note carefully all cases of decay you will see that caries very

seldom begins primarily upon the angle, consequently the angle of a tooth is a safe line toward which to cut, but never cut around an angle for extension for prevention.

Concerning definitions, take up primary and recurrent caries. I have always used the term "recurrent caries" to express a reattack of a surface on which a filling has been made, no matter what the cause may be, recognizing two conditions in which decay recurs—one in which the filling has been perfect and the caries occurs just the same as primary caries; the other in which the filling has been imperfect, and the decay occurs between the cavity wall and filling because of leakage.

The study of immunity is very important. Many of the fillings which have lasted for twenty or thirty years are in immune mouths. The filling is imperfect and would not last a year if the conditions of susceptibility were present, as we often see them in young people. The filling is bad in every respect, yet it lasts, but in that mouth you will find that decay has not been progressing on the other surfaces of the teeth. In other cases we may find a filling that has prevented recurrence of decay where everything else about it has gone to rack, so we know that fillings properly made in cavities properly prepared do protect. Caries is our subject, and we must understand it well so as to cut this or that cavity. With an understanding of caries we may make modifications to suit the conditions found, and that is extension for prevention. In the mechanical operation for filling we must cut for access, for simplification and for strength, and the man who fails or is afraid to do all these things ought not to make a filling.

We should never perform operations on the teeth of our young patients that would make possible a breaking down of the nervous system, no matter what the conditions might be, and we also should not break down the courage of our young patients and render them liable to neglect their teeth because of the fear of dental work. Do not try to make permanent operations where the conditions are such that you will fail to make good fillings. Tide your patient along and work for the conditions that will enable you to do good work.

Concerning separators, I first want to enter an objection to those that slip over the enamel or slide into the interproximal space. The proper separator should lift the teeth apart. I know of no way that we can relieve our patients from so much suffering as by their use.

It used to be one of the worries of my life in inserting gold fillings to use the mallet upon teeth whose periodontal membranes had been made sore by slow separation. The Perry separator enables me to lift the teeth apart with the least possible amount of pain, secure room to make the filling, and do it with the membrane of the teeth in good condition to withstand the necessary malleting. The patient is relieved from the pain in condensing the filling that used to be present with the slow method of separation. As regards the injury to the enamel, I have subjected extracted teeth to as much strain as I thought the separator would bear, afterward grinding the enamel to see whether there had been any injury, and I have examined teeth that had been separated in the mouth, and I can see no reason for injuring the enamel with a separator. Patients are hurt with a separator when it is screwed up tight and left so that it will rock up and down and back and forth. The separator should be propped with gutta-percha under each bow. Furthermore, if you put the separator on bell-crowned teeth, and do not prop it to prevent its slipping into the soft tissue, you will do your patient a lasting injury.

Dr. J. G. Reid, Chicago: I agree with everything that the essayist has said, so would refer to only one point, namely, the abuse of finishing strips. This is one thing which has led me for many years to use tin and gold as a finishing material at the cervical margins, because it can be trimmed and shaped with instruments and precludes the use of those damnable sandpaper strips.

Dr. F. H. Skinner, Chicago: The remarks of Dr. Black with regard to separation apply to teeth which are not close together, but when the surface of a tooth is so lost that the gingival margins of it and the adjoining tooth are touching, I would ask Dr. Black if he does not consider previous separation absolutely necessary?

Dr. Black: Most assuredly. In such cases I generally spread the teeth a little with the Perry separator, put in gutta-percha and let it get hard, repeating the operation every few days until sufficient room is secured. This or other methods of slow separation will not cause soreness.

Dr. J. N. Crouse, Chicago: I use the Perry and the Parr separators; the latter is more in the way and harder to adjust, but can occasionally be used where the other cannot. I prop the separator as suggested by Dr. Black, but use modeling compound instead of gutta-percha.

Dr. Nyman, closing discussion: This paper was not directed against Dr. Black, but against that class of extremists who extend everything under all circumstances; also against those men in the East who have repeatedly drawn faulty conclusions from what Dr. Black has written. One seldom finds small proximal cavities in bicuspid and molars. By the time they are evident nine out of ten of them would be classed as medium cavities. I think much of the dispute that has arisen East and West has been due to the fact that use was made of the term "self-cleansing," because the inference is that the teeth are left to care for themselves, receiving no care or brushing from the patient. Nobody deprecates more than I do the injudicious use of disks and strips along the gingival margin. The great trouble in using separators is that the tips and not the surfaces of the beaks come in contact with the teeth. I used to be worried by those compound cavities in molars and bicuspid which extended below the gum, involving the whole proximal wall, and which required separation of the teeth for proper operation. Now I simply remove the decay, break down the weak enamel walls and pack with gutta-percha, always instructing the patient to chew on that side. A month later I pack in more gutta-percha, and before long have the teeth sufficiently separated and the gum tissues crowded away from the gum margins. I first fill the gingival third of the cavity and then slide in a wooden wedge which does not impinge upon the septum. This maintains space while I put in the rest of the gold.

SOME OF OUR PREDECESSORS.

BY A. H. FULLER, D.D.S., ST. LOUIS. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

I have chosen this subject with the view of presenting portraits of a number of those who have passed to the unknown shore, and who were active in advancing our profession along lines of progress, thus adding to the usefulness and respectability of the calling. While not intending to enter upon the history of the profession of dentistry, it may be necessary to make some reference to dental history in order to properly give credit to those to whom it is due, the grateful remembrance of their successors in many cases being the only legacy left to family or friends. Their names should be familiar to every member of the profession. We should emulate them in our works

and appreciate the benefits we have received from their labors. Most of those whose portraits will be presented have been identified with the profession in America.

The first picture shown upon the screen is that of *Ambroise Pare*, known as the first practitioner of modern surgery. He was born at Laval, France, early in the sixteenth century, and died in Paris, Dec. 22, 1590. He accompanied the French army to Italy as surgeon in 1536, and wrote numerous works on surgery. In one of his books, written in 1579, he gives a very correct account of the teeth, their number, position and uses. In cases of toothache he advises calling a physician and recommends purging, phlebotomy, cupping glasses to neck and shoulders, scarification, washing the mouth with the juice of pomegranates, plantain water, concocted vinegar, etc., narcotics to be dropped in the ear in order to stupefy the nerves, leeches to the gums, and opening the veins under the tongue and behind the ears. He describes the operation of transplanting teeth, and relates a case where it was reported a success. He says: "Teeth artificially made of bone or ivory may be put in the place of those that are wanting; and they must be joined one fast unto another, and also fastened unto the natural teeth adjoining that are whole; and this must chiefly be done by a thread of gold or silver." He used the pelican for extracting teeth, which instrument, Nasmyth says, was in use in London as late as 1830. These quotations are given to show that during the two hundred succeeding years, as evidenced by the writing of John Hunter and the testimony of Paul Revere, given elsewhere, there was little advance in dentistry—surgical, operative or mechanical.

The next slide is that of *Pierre Fauchard*, who wrote in 1728-46 and '86.

John Hunter, surgeon and physiologist. England. Born 1728—died 1793. John Hunter was the son of a farmer, and when seventeen years of age was apprenticed as a cabinet-maker to his brother-in-law. He afterwards assisted his brother William, who was a lecturer on surgery in London. He continued in his anatomical work, took up and completed the study of medicine and surgery, received an army appointment and served as staff surgeon for four years, where he collected material for his work on gunshot wounds which was published after his death. It is not necessary in this connection to refer to the numerous works and papers of this well-

known writer. His first original published work was "Natural History of the Human Teeth." The first part was published in 1771, the second part in 1778, and it has the credit of being the first work on dentistry of any scientific value published in the English language. Thomas Berdmore, an Englishman, published a work in 1770 entitled "Operations on the Teeth," but this was more a history of cases than anything else. Previous to the book by Hunter, numerous works in the French or German had been published, notably those of Fauchard in 1728-46-86, Bourdet, 1754 to 1764, and Jourdain, 1756 to 1766, in the French. Following Hunter, the early part of the nineteenth century was prolific with works on dentistry, many of them of much merit—among them Fox, Fuller, Bell, Robinson, Murphy, Bew, Koecker, Snell, Jobson, and numerous others in English, and in French, Dellabarre, Maury, Lefoulon, Serres, Rousseau, Geriot, Duval, Blandin and Schange, who wrote on the treatment of irregularities of the teeth.

Sir John Tomes. Born March 21, 1815; died July 29, 1895. Better known in America from his authorship of *Tomes' Dental Surgery* than from anything else, although in England he is honored and loved for his untiring efforts for the advancement of the dental profession. Sir John Tomes took up the study of medicine in 1831, and commenced the practice of dentistry in 1840. In 1859 the first edition of his *Dental Surgery* was issued, which has had numerous subsequent editions. He, with others, struggled sixteen years for the recognition of dentistry before the department of Dental Surgery was established by the College of Surgeons in 1859. Twenty years later the Dental Act was passed. He was knighted for eminent services rendered his profession, and was honored by his confreres with every high office within their gift, and frequently by tokens of regard and appreciation. His contributions to the literature of the profession are numerous and of great worth.

Sir Edwin Saunders. Born in London, 1814; died 1901. Adviser of Queen Victoria for forty years. Knighted 1883. Was one of the organizers of the Odontological Society of Great Britain, and twice its President. (First society in England.) Was largely instrumental in the organization of the first dental school, and was one of its trustees. His energetic assistance was recognized by his friends, who established the Saunders Scholarship. Sir Edwin was chairman of the dental section of the International Medical Congress

in 1881, and President of the Metropolitan Counties Branch of the British Medical Association the same year. This recognition of our profession as a branch of medicine was highly appreciated. He was also President of the British Dental Association in 1886. Altogether, he was an honor to his profession which honored him, and an honor to the country which gave him birth..

Dr. Emil Magitot. Born in Paris, 1833; died in Paris, 1897. An honorary member of this society. Dr. Magitot was the son of a dentist graduated in medicine, and made the study of the teeth and their diseases a life work. His books easily made him the leading man in France on dental subjects. In conjunction with Charles Robin and Ch. Legros he wrote numerous publications on The Development and Structure of the Teeth and on the Genesis and Evolution of the Teeth of Man and Lower Animals. His works on Dental Anomalies and Dental Caries are well known, the latter being translated into English by Dr. Chandler of Boston.

Professor Hollander. Died at Halle, Germany, 1897. Dr. Hollander was head of the dental department of the University of Halle for twenty years previous to his death. His works on the "Extraction of the Teeth," "Methods of Filling Teeth," and a manual on "Dental Medicine" are well known; he also translated into German Kingsley's Oral Deformities and Tones' Dental Anatomy.

Paul Revere. Born 1735. Died 1818. (The Midnight Ride of Paul Revere.—Longfellow.) There are discrepancies in our history of dentistry, as to who first practiced the calling in the Colonies. We have, however, a good line of facts from which to draw conclusions.

Dr. John Greenwood, in his memoirs, published by his son, states that his father, Isaac Greenwood, was the first practicing dentist in Boston. John Greenwood was born May, 1760. It is more than probable that his father was in dental practice at that time.

Mr. Baker, a surgeon dentist from England, located in Boston soon after this, and from him Paul Revere learned the art. Mr. Baker, then located on School street, advertised in the *Boston Gazette* as follows: "I take this method to express my gratitude to the public for favors received and hope that those who doubted the safety of my art, from its novelty in this country, are now convinced of its safety and usefulness." He also stated that his pots of dentifrice were sealed with his coat-of-arms to prevent fraud. When Mr. Baker left Boston he probably went to Philadelphia, as Watson's

Annals of Philadelphia speak of a Mr. Baker as the first person ever known as a dentist in that city, Vol. I, page 179. Paul Revere took his practice and advertised to this effect: "He flatters himself from the experience he has had these two years (in which time he has fixed some hundreds of teeth), that he can fix them as well as any Surgeon Dentist that ever came from London. He fixes them in such a manner that they are not only an ornament, but of real use in speaking and eating. He cleanses the teeth and will wait upon any lady or gentleman at their lodgings—he may be spoken with at his shop opposite Dr. Clark's," etc. This was about 1768. His artificial teeth are said to have been carved from the ivory of walrus teeth and fastened with gold wire. There is no evidence that he filled teeth.

An incident of interest in this connection: After the evacuation of Boston by the British troops in 1776 the friends of General Joseph Warren, killed at the battle of Bunker Hill, June 17, 1775, were informed where his body had been buried in a grave "with a person with a frock on." General Warren wore an artificial tooth. Identification was rendered doubly certain by Colonel Revere, who set the artificial tooth which he wore, and who recollected the size and kind of wire he used in fastening it. This, I think, is one among the first instances where a dental operation was convincing as evidence. In the same city the Webster-Parkman murder was proven by a gold plate found and identified by the maker as worn by the murdered man. Paul Revere served through the War of the Revolution, attaining the rank of lieutenant-colonel of artillery, and after its close established the Revere Copper Works, which are still in existence. He was a manufacturing jeweler previous to practicing dentistry. A fine specimen of his work, a silver tea-pot, was on exhibition at a late exhibit at the rooms of the Missouri Historical Society.

John Greenwood. John Greenwood is known to everyone in the dental profession, and to almost every native-born American, as the dentist for many years of George Washington. Mr. Greenwood was born in Boston in 1760, and was the son of Isaac Greenwood, the first practicing dentist in that city. His grandfather, Rev. Isaac Greenwood, was born in England, came to this country when a young man, held a professorship in Harvard College, teaching mathematics and natural philosophy, and was afterwards preacher in the

old North Church in Boston for many years. John attended the North School in Boston until thirteen years of age, when he was sent to learn the trade of cabinet-making with his uncle, Thales Greenwood, at Portland, Me. For two years he continued at this work, or until the battle of Lexington was fought. While here he learned to play the fife and served as fifer in an independent local company of which his uncle was first lieutenant.

The martial trend of everything at this time induced him, as he says, to elope, and he pulled out for Boston. Being unable to reach home, and without money, he enlisted in Captain Bliss' company as fifer at \$8.00 per month. To shorten this sketch, it is necessary to eliminate much of interest, but it should be stated that young Greenwood took part in the battle of Bunker Hill, of which he gives a lengthy description. He afterwards served with Benedict Arnold in Canada, along Lake Champlain, and at Ticonderoga, fighting Indians and British, returning in time to take part in the battle of Trenton after his term of enlistment had expired. Returning home, after two or three months' rest he secured a position as steward's mate, with rating of midshipman, on the Cumberland, a privateer carrying eighteen six-pounders and crew of one hundred and thirty men. As privateersman and prisoner he served until the close of the War of the Revolution, with many escapes from danger and death. His younger brother, Clark Greenwood, at this time was practicing dentistry in New York, but is said to have discouraged John from the study of dentistry, so he commenced the manufacture of nautical and mathematical instruments, finally working into the practice of dentistry and employing his brother, among others, as his assistant. I have extended this sketch to show that Mr. Greenwood had some personality and was deserving of the recognition he received.

Since writing this sketch a clipping from one of our daily papers has attracted my attention: "*Washington's Mythical False Teeth*. George Washington's false teeth, which were supposed to have been made of ivory, are giving a certain class of freak historians about as much trouble as they must have given the venerable patriot who wore them," said one of the professors of the Smithsonian Institute to a *Washington Star* reporter recently. "Many times a year for several years this institution has been called upon to produce these mysterious teeth for the inspection of persons who insist that they

are here. Our matter of fact answers to these inquiries that Washington had no false teeth, or at least if he did, that they are not in the possession of the Museum, seems only to stimulate the inquiring mind to protest our statement. They proceed to give us authentic accounts of these teeth, and always conclude with expressing the belief that they must be in the Museum somewhere. Where or how the idea that Washington had false teeth originated is an unsolved mystery. That it is firmly believed by many is certainly a fact. There seems to be no authentic record of the father of his country possessing ivory teeth, and by a study of the bust we have of him, which was made but a few years before his death, there is no indication of an indentation along the line of the gums such as can be noticed in persons who have had their teeth drawn, even though they wear artificial ones. However, we will continue to answer the same questions in the same way many times in the future. According to some biographers, Washington lost his teeth during his service as commander in chief of the Continental Army, and had a set of ivory ones made. These teeth, it is also stated, gave him much trouble because they did not fit." The professor quoted above must be out of the same box with Maclay, the historian of the United States Navy. There is no fact better authenticated than that George Washington wore false teeth made by John Greenwood—some of which are still preserved.

James Gardette. Born in France in 1756, studied medicine in Paris 1773-1775, afterwards spending two years in hospital practice in London, when he was commissioned as surgeon in the French Navy. He resigned from the navy and took up dentistry at Newport in 1781, removed to New York in 1783, and to Philadelphia in 1784, where he continued in successful practice until 1829—forty-five years—when he returned to France, dying at Bordeaux in 1831. He was among the first to use gold foil instead of lead for filling teeth; the first to use flat clasps in the retention of plates, and has been credited with the first application of suction for retaining plates. An article on "The Transplantation of the Human Teeth," in which he discourages this practice, copied from the *Medical Recorder*, may be found in the first series of the *American Journal of Dental Science*. In the article referred to he speaks of Joseph Lemayeur (or Lemaire) as being in practice in Philadelphia.

Joseph Lemaire. While Dr. Joseph Lemaire has been accredited

as the first dentist to enter regular practice in America, it would seem that there were several others who were in practice previous to his arrival, among them Mr. John Woofendale, who came over in 1766. Mr. Woofendale was a student of Mr. Berdmore, who has been referred to before. Mr. John Greenwood in his memoirs speaks of his father as practicing dentistry in Boston at the beginning of the Revolutionary War, and he must have been before that time, as Clark Greenwood, brother of John, was in New York in practice when John first commenced business there as a nautical instrument maker after the close of the war in 1782. It would appear also that a Mr. Whitelock and a Mr. Baker were in practice at this early date in Philadelphia.

Dr. Lemaire advertised to transplant, replant and implant teeth (1784). He afterwards told Dr. Gardette that of all the one hundred and seventy teeth he had transplanted not one succeeded.

Josiah Flagg. Lemaire came over with the French army of Count Rochambeau in 1781, and from him Josiah Flagg, the first of the dentists of that name, obtained his instruction in dentistry. He later settled in Boston. A circular of Dr. Flagg's is extant in which he advertises "to transplant teeth, cure ulcers, fasten loose teeth, mend teeth with foil or gold, sew up hare-lips, make artificial teeth, fix gold roofs and palates, greatly assisting the pronunciation and the swallow. Sells by wholesale and retail dentifrices, tinctures, chew-sticks, masticks, teeth and gum brushes suitable for every age, complaint and climate." Dr. Flagg held a Major's commission in the American Army, and during the war of 1812 was taken as a prisoner to England, where while on parole he assisted Sir Ashley Cooper in his operations at Guy's Hospital.

Horace H. Hayden. Born Oct. 13, 1768. When 14 years of age he went to sea as a cabin boy. Two years later, being thrown on his own resources, he became an apprentice to an architect, which business he followed for eight years.. At this age—twenty-four—being in New York and needing dental services, he applied to Mr. Greenwood for treatment, and while in his hands determined to become a dentist. He procured books and instruments, and some years later established himself in Baltimore—1804. He took up the study of medicine and received honorary degrees from both the University of Maryland and Jefferson Medical College. In 1825 he delivered a course of lectures on dentistry before the medical

class of the University of Maryland. He assisted in the founding of the Baltimore Dental College, and filled the chair of Dental Physiology and Pathology. He was the first president of the American Society of Dental Surgeons, which was organized in 1840. This office he held until his death in 1844. He wrote a book on Geology and many papers on medical and dental subjects. He accomplished all this without regular education in these directions.

Leonard Koecker. He was born in Bremen, Hanover, in 1785, and in early life engaged in mercantile pursuits. His early acquaintance with a traveling Jew dentist turned his attention in this direction. He came to this country as a commercial agent, but failed, and about 1807 began the practice of dentistry in Philadelphia without any knowledge of the profession. His native ability and energy remedied many defects in that direction. Parmlly, in relating Koecker's first case in Philadelphia, one of simple extraction of a tooth which caused him much embarrassment, says, "He grasped the tooth with an instrument, shut his eyes, turned his head from the patient, and made a strong effort which dislodged the tooth, he being meanwhile so excited that he knew not whether the tooth was out or the jaw broken. The patient assured the trembling operator that he had never before had a tooth removed so easily, and from that patient's influence his success commenced." He practiced in Philadelphia until 1822, when his health compelled a voyage to Europe, and he eventually settled in London, where he remained until his death in 1850. He had a very extensive and widely known dental practice. He published a work on Dental Surgery in 1826 which is even now frequently referred to.

Edward Hudson. Edward Hudson began the practice of dentistry in Philadelphia in 1805. He was born in Ireland in 1772, of Quaker parents. Being left an orphan at an early age, he was adopted as a son by his cousin, a practicing dentist of Dublin, and soon after entered Trinity College, his progress delighting his benefactor. Hudson pursued the practice of dental surgery in his cousin's office and perfected himself in the requirements of this profession. His political enthusiasm caused his arrest and imprisonment in Fort George, Scotland, until after the peace of Amiens. After being released he came to America. Dr. Eleazer Parmlly says of him, "We are probably more indebted to his suc-

cess than to that of any other man for the importance which was attached at that period to operations which were intended to preserve the natural teeth in their natural state, for by the complete success attending the practice of this great man, the public were convinced that teeth could be saved instead of being extracted." I present a facsimile of a bill for services rendered by Mr. Hudson in 1825, which, considering the date, shows that he respected himself. Many dentists of to-day do not.

Dr. Eleazer Parmly. Born in Braintree, Vt., March 13, 1797. Died in New York, December 13, 1874. In an address delivered before the American Society of Dental Surgeons nearly sixty years ago, he gave an interesting account of his experiences as a dentist during the thirty years he had been an active member of or connected with the dental profession. The satisfaction expressed as felt at the advanced state of the profession at the time is almost amusing. To quote from the article—he says, "I shall leave it for those who hear me, especially for the younger members of the society, to make a comparison in their own minds between the embarrassments of that period and the facilities of the present day. In 1812 my brother, older than myself, became acquainted with Dr. Petrie, an English dentist, from whom I believe he obtained his first knowledge of operations upon the teeth. He soon after came to Boston, where he commenced practice, and had the good fortune to become acquainted with the warm-hearted Dr. Randall, to whose friendly interest he was indebted for a handsome letter in testimony of his zeal and ingenuity, which letter he keeps to this day as a sacred treasure. To the liberal commendation which the Doctor was pleased to bestow upon him in that letter, in addition to the professional information which he frankly communicated to him, my brother was chiefly indebted for his early success. In 1815 he proceeded to Montreal, where I joined him at the age of eighteen. He employed me at first in carving and manufacturing teeth from the tusk of the sea-horse. In the same year we both went to Quebec, where I saw for the first time a front tooth that had been beautifully stopped with gold by Mr. Waite of London. But I had no idea at the time how the gold was secured, or what gave it its firm-looking body, and its smooth, solid and polished surface. On leaving Quebec for the purpose of a tour through the western states of this Union, I did not leave behind me the recol-

lection of the beautiful operation that I had seen, and which to this day clings vividly to my memory. While at Pittsburg I saw a mouth that had been treated by Mr. Koecker, very differently from any I had before seen. I also saw there some teeth that had been filled by our worthy and esteemed President (Dr. H. H. Hayden). These two cases gave me an idea of filling teeth. In Lexington, Ky., I saw the mouths of two young ladies who had been with Mr. Hudson of Philadelphia, whose stoppings looked like the one I had seen in Quebec. Up to this time I had never seen any gold for stopping teeth. I here obtained some gold coin and took it to a silver-plater. He melted, hammered and rolled the coin, bringing it in his mill to a degree of thinness and pliability of which I had previously no conception. This gold I immediately began to use for stopping teeth, and but three years since I saw one of the teeth which I then stopped. In Lexington, Ky., I first saw a mineral tooth in the mouth of a French gentleman. This was an improvement upon the teeth that I was making from sea-horse and cattle teeth. In New Orleans I first saw a gold plate that had been struck on a model in London. All the plates that I had previously seen had been filed and bent into something like the form required. Soon afterwards (1820) I embarked for London, intending to find out how all these things were done. My first business was to purchase all the books on dental surgery that had been published in the English language. None of them gave information as to how these operations were performed, but all gave evidence of the benefits to be derived from them. The dentists all received me politely and conversed with me freely, both in London and Paris, but with the exception of Mr. Maury they failed to show me anything, but all wished me success. But for Mr. Maury's kindness I might have left Paris without having seen a complete dental cabinet."

Dr. Parmly practiced for four years in London, but was unable to find the party who manufactured the gold foil used by Mr. Waite, who was, as Dr. Parmly pleased to call him, "the Hudson of England." I have gleaned these few items to show the secretiveness exhibited up to the time of the organization of dental societies, accounting in this way for the entire lack of advancement during the three hundred preceding years. Dr. Eleazer Parmly was one of the organizers of the first dental society and of the first dental journal, and one of the makers of the dental profession.

Dr. Amos Westcott. Born in Herkimer Co., New York, in 1815. Died at Syracuse, N. Y., in 1873. Graduated as civil engineer from Rensselaer Institute in 1835, and in medicine from Albany Medical College in 1840. Located in Syracuse in 1841, where he lived and died. Dr. Westcott was for a time a professor in the Baltimore Dental College and an associate editor of the *American Journal of Dental Science*. Dr. Westcott's name has been associated with the discovery of the adhesive properties of gold foil. He contributed largely to dental literature, and is further celebrated as the father of the author of "David Harum."

Chapin A. Harris. So well known by his works, was born near the beginning of the 19th century, in the State of New York; began the study of medicine in 1820; took up dentistry after graduating in medicine, and at first practiced both callings. He organized the first dental college, helped to organize and edit the first dental journal, and was active in forming the first dental society. Wrote and translated numerous works, of which Harris' Principles and Practice of Dentistry is possibly the best known. He might well be called the father of dentistry.

Robert Arthur. Born July 22, 1819. Died June 22, 1880. Studied dentistry with Chapin A. Harris. Graduated from Baltimore College. Received the first degree of D. D. S. ever conferred. Taught in Philadelphia, Pa., and Baltimore colleges. Wrote numerous articles and works. Made known the use of adhesive foil in 1855. Wrote extensively on prevention of decay of the teeth. Recommended separating or "Arthurizing," and invented disks of corundum for the purpose.

Dr. Asa Hill. Born Nov. 20, 1815. Died Nov. 25, 1874. Dr. Hill was born, lived and died at Norwalk, Conn. He was a practitioner of great merit; a contributor to the *News-Letter* and *American Journal of Dental Science*; a member of the dental societies then formed, and the inventor and introducer of the stopping that bears his name.

Dr. Elisha Townsend. Born 1804. Died 1858. One of the most energetic and active dentists during his twenty-five years of practice. Organizer of dental societies, professor in dental colleges, and the originator of the well-known Townsend amalgam. The notices of his death show the high regard in which he was held by the entire dental profession.

Dr. Edward Maynard. Born in Madison, N. Y., April, 1813. Died May 4, 1891. Dr. Maynard was prominent as a dentist for over fifty years. Was one of the editors of the *American Journal of Dental Science*. He was at one time professor of Theory and Practice in the Baltimore College of Dental Surgery, and afterwards in the Dental Department of the National University at Washington, D. C. Dr. Maynard practiced his profession for some time in St. Petersburg, Russia, having as clients the imperial family and the nobility. He made many improvements in dental instruments. Was the inventor of the first magazine gun—the Maynard rifle. He was introduced to many of the dentists attending the Medical Congress held in Washington in 1887.

Dr. William H. Dwinelle, A. M., M. D., D. D. S. Born in Cazenovia, N. Y. Died in Cazenovia, February, 1896. For upwards of fifty years a dental practitioner of eminence. Inventor of numerous instruments and appliances, among them the jack-screw as applied to regulation of teeth. Writer of ability and one of the editors of the *American Journal of Dental Science*. During his time was among the foremost men in the dental profession, and active in dental and other societies.

Dr. Thomas B. Gunning. One of the first to use vulcanized rubber in the manufacture of interdental splints. Was made famous by his successful treatment of Secretary Seward after his attempted assassination in 1865.

Dr. S. C. Barnum. Born in Sullivan County, N. Y. Died in New York City, Dec. 24, 1885. Made known through Dr. J. W. Clowes in June, 1864, to the dental profession the benefits to be derived from the use of the rubber dam. The use of this device has revolutionized the practice of dentistry. Dr. Allen of Kansas City has greatly added to its usefulness by the illuminated surface which he has given it.

Dr. John M. Riggs. Born in Seymour, Conn., Oct., 1810. Died in Hartford, Conn., Nov., 1885. Dr. Riggs practiced dentistry in Hartford, Conn., for forty-five years. He is credited with having performed the first surgical operation under an anesthetic—extracting a tooth for Dr. Horace Wells, Dec. 11, 1844. Also described and instituted treatment for pyorrhea alveolaris (Riggs' disease). Was a member of Connecticut Valley, and vice-president of Southern Dental Association.

Dr. Gardner Quincy Colton. Born in Vermont in 1814. Died in Holland in 1898. Well known in connection with the introduction of nitrous oxid gas in extracting teeth, and the Colton Dental Associations in various cities, established for the administration of gas for the purpose of tooth extraction.

Dr. Horace Wells, who first discovered anesthesia. In this connection we have in the last three pictures Dr. Wells, who was the patient upon whom the first surgical operation under an anesthetic was ever performed; Dr. Riggs, the operator who extracted a tooth for Dr. Wells, and Dr. Colton, who administered the anesthetic—nitrous oxid gas—this on December 11, 1844.

Dr. James Taylor, M.D., D.D.S. Died June 12, 1881. Dr. Taylor was one of the active agents in founding the Ohio College of Dental Surgery. President of the American Dental Convention in 1857. Member of the Mississippi Valley Association of Dental Surgeons from its beginning to the time of his death; at one time editor, proprietor and publisher of the *Dental Register*, and during his whole career actively engaged in advancing the profession of dentistry.

Dr. Geo. Watt. Born near Xenia, Ohio, 1820. Died at Xenia, February, 1893. Dr. Watt, lineal descendant of James Watt, who perfected the steam engine. Graduated in medicine and practiced that profession until 1852. Studied dentistry, graduating in 1854. Professor of chemistry in Ohio Dental College. Surgeon in army during War of the Rebellion. Editorially associated with *Dental Register of the West*. Editor *Ohio Journal of Dental Science*. President of American, Ohio State, Mississippi Valley and other dental societies. Honorary member of this Society.

Wm. H. Morgan, M.D., D.D.S. Born in Kentucky, Feb. 22, 1818. Died at Nashville, Tenn., May 16, 1901. Dr. Morgan was a practitioner of dentistry for over fifty years, and was renowned as an operator. Active in dental associations and in everything that elevated dentistry. Organized the Dental Department of Vanderbilt University, and was its dean for years. President of American, Southern, Mississippi Valley, Tennessee State and other dental societies. An active worker in the church, etc.

Dr. Benjamin H. Catching. Born at Georgetown, Miss., 1848. Died at Atlanta, Ga., November, 1899. Dr. Catching was well known as the editor of "Catching's Compendium," and also of the *Southern*

Dental Journal and the *American Dental Weekly*. He was always active in societies and in any work that benefited the profession of his choice.

Dr. Thomas W. Evans. Born in Philadelphia in 1823. Died in Paris, France, in 1897. Dr. Evans, the world-renowned dentist and philanthropist, received a common school education, and at the age of fourteen entered as an apprentice the employ of Joseph Warner, a gold and silversmith. A few years later he became a student of Dr. J. D. White, with whom he remained two years. He graduated from the Jefferson Medical College, and practiced dentistry in Maryland and Pennsylvania. In 1848 he went to Paris, associating himself with Dr. C. S. Brewster. His eminence in the profession was soon to be acknowledged, and his career from this time is well known to us all.

Dr. Thomas L. Buckingham. Born in Delaware, March, 1816. Died in Philadelphia, September, 1883. Practiced dentistry in Philadelphia for nearly forty years. Was professor of Mechanical Dentistry in the Philadelphia College of Dental Surgery during its four years of existence. Then as professor of Mechanical Dentistry and afterwards Chemistry he taught in the Pennsylvania College of Dental Surgery up to the time of his death. Was active in societies, in all of which he was prominent.

Samuel Stockton White, D.D.S. Born in Pennsylvania, June, 1822. Died in Paris, France, Dec. 30, 1879. It is unnecessary to state to an assembly of dentists that Dr. S. S. White was the founder of the S. S. White Dental Manufacturing Company, and that for years his influence was great in advancing the dental profession along progressive lines.

Dr. James W. White. Born in Pennsylvania, September, 1826. Died in Philadelphia, May, 1891. Dr. White as editor of the *Dental Cosmos* and President of the S. S. White Dental Manufacturing Company, as well as from his numerous contributions to the literature of the dental profession, is well known to every student of dentistry. His every effort was for the advancement of the profession.

John De Haven White, M.D., D.D.S. Born at Lancaster, Pa., August, 1815. Died at Philadelphia, Dec. 25, 1895. Dr. J. D. White was one of the organizers of the Pennsylvania Association of Dental Surgeons; an organizer and professor in the Pennsylvania College

of Dental Surgery; editor of the *Dental News Letter* and *Dental Cosmos*, and a dentist of excellent standing in Philadelphia for many years. Active in everything tending to advance the dental profession.

John Hugh McQuillen. Born in Philadelphia, February, 1826. Died in Philadelphia, March, 1879. Dr. McQuillen was a professor in the Philadelphia College of Dental Surgery, afterwards dean and professor in the Philadelphia Dental College; editor of *Dental Cosmos*, and president of the American and other dental associations. An excellent operator and active in all advances of the profession.

Dr. James Edmund Garretson. Born in Delaware, October, 1828. Died October, 1895. Dr. Garretson commenced the study of dentistry in 1850, graduated in 1856, and in medicine in 1859. He was the first to make oral surgery a special branch of surgery. He contributed to the dental journals from the time of the *News Letter*. Wrote numerous works, the principal of which is his "System of Oral Surgery."

Dr. Royal William Varney. Born in Ohio, October, 1839. Died at Savannah, Ga., April, 1872. Dr. Varney was an assistant surgeon during the War of the Rebellion. Settled in New York City after its close. Was the originator of the Varney Mallet Pluggers, and one of the finest operators the country has ever known.

Charles J. Essig, M.D., D.D.S. Born in Philadelphia, July, 1841. Died in Wallingford, Pa., December, 1901. Dr. Essig was a graduate of Jefferson Medical and Philadelphia Dental Colleges, and a professor both in the Philadelphia Dental College and Dental Department of the University of Pennsylvania. His work on Dental Metallurgy, also the American Text-Book of Prosthetic Dentistry, which he edited, are both well known.

Dr. Thomas H. Chandler. Connected with the Harvard Dental School from its inception to the time of his death in 1895. He held the deanship for twenty-one years, and the love and respect of both students and faculty during his whole career.

Marshall H. Webb, D.D.S. Born in Chester County, Pa., October, 1844. Died at Lancaster, Pa., January, 1882. Was a graduate of the Philadelphia Dental College in 1867. Was a member of numerous dental societies and an operator of marked ability. His demonstrations before the different dental societies illustrating his methods of

contour work were always interesting and instructive. His writings were an addition of value to dental literature.

Dr. Edwin James Dunning. Born in New York State, July, 1821. Died at Cambridge, Mass., March, 1901. Dr. Dunning, student of Dr. Arnold Westcott, afterwards an assistant of Dr. Eleazer Parmly, practiced in New York for twenty years, and at one time filled the chair of Operative Dentistry in the New York College of Dentistry.

Frank Abbott, M. D. Born in Maine, September, 1836. Died at New York, April, 1897. Dr. Abbott was for years prominent in the dental profession; dean of the New York College of Dentistry; president American and numerous other dental societies; writer of several works on dental subjects.

Wm. H. Atkinson, M.D., D.D.S. Born in Pennsylvania, January, 1815. Died in New York, April, 1891. Dr. Atkinson was probably more widely known in the profession during his long and active career than any other man in it. He was a fluent talker, an excellent operator, and enthusiastic in everything he undertook. He was instrumental in introducing the mallet for condensing cohesive gold, and a great worker in dental societies, in many of which he held the highest office in their gift.

M. S. Dean, D.D.S. Born at Pittsfield, Vt., 1825. Died at Chicago, 1882. Dr. Dean first took up the study of medicine and afterwards that of dentistry. He practiced dentistry in Canada, Ohio and Michigan, afterwards locating in Chicago, where he continued for nearly twenty years. He was active in organizing this Society and served as its president. Was twice president of the Chicago Dental Society, and held this position in the American Dental Association. His contributions to the literature of the profession were valuable, and his translation with notes of "The Dental Follicle," by Legros and Magitot, is among the works which are in active request at this time.

Dr. George H. Cushing. Born in Providence, R. I., 1829. Died at Los Angeles, Cal., May 25, 1900. Dr. Cushing, so well known to us all, was president of the American, Illinois State, Chicago and other societies, and secretary for years of the American and National Dental Associations. He spent a long life in the practice of dentistry and for the advancement of that profession.

Dr. Walter Webb Allport. Born in New York State, June, 1824. Died at Chicago, March, 1893. Dr. Allport first studied medicine,

afterwards took up dentistry, and graduated from New York Dental College in 1853. Was prominent in the dental profession as an operator, and was at all times active in its advancement. Was president of the American Dental Convention, the American and Mississippi Valley Dental Societies, and editor of the *People's Dental Journal* for two years. Practiced in Chicago for almost forty years.

Dr. A. W. Freeman. Born at Brookfield, Vt., October, 1829. Died at Normal Park, Ill., Feb. 23, 1899. Dr. Freeman graduated from Dartmouth College in 1854. Afterwards taught school at Randolph, Vt., and Rockford, Ill., for several years, being principal of high school. Moving to Chicago in 1859, he commenced the practice of dentistry, which he followed for forty years. As an active member in dental societies he stood for everything that was good.

Dr. John Joseph Ravenscroft Patrick. Born in Liverpool, Eng., in 1828. Died in Belleville, Ill., in 1865. Dr. Patrick was the son of a physician, and at one time thought of following in his father's footsteps, so he first studied medicine, then served an apprenticeship as a jeweler, and finally took up dentistry, studying with his brother Hugh. Dr. Patrick was professor in the Missouri Dental College, and the Iowa State University, Dental Department. Was a writer and inventor, and a member of the Illinois and Missouri State Dental Societies and the American and other associations. His crown machine and regulating appliances were ingenious devices. Was vice-president of this Society 1882-83.

Andrew M. Leslie, D.D.S. Born in Scotland. Died in Memphis, Tenn., of cholera, November, 1866. Dr. Leslie graduated from the Ohio College of Dental Surgery in 1847, practiced in Cincinnati until 1856, when he moved to St. Louis and established the Missouri Dental Depot. Dr. Leslie was active in forming the St. Louis Dental Society and was its secretary for a number of years. He also assisted in organizing the Missouri Dental College.

Dr. Henry E. Peebles. Born in Virginia in 1812. Died in St. Louis, Feb. 14, 1871. Dr. Peebles was an active member of the American, Western, Missouri and St. Louis Dental Societies, and an honorary member of this Society. He contributed numerous articles to the dental journals, those on correcting irregularities of the teeth being specially interesting at that time.

Dr. Isaiah Forbes. Born at Albany, N. Y., 1810. Died at St.

Louis, 1885. Dr. Forbes came to St. Louis in 1837 and found but two dentists in the city. He was active in societies, city, state and national, filling with honor every position to which he was assigned. As an honorary member of this Society he was active in attendance and work for the common good.

Homer Judd, M.D., D.D.S. Born in Berkshire Co., Mass., March 29, 1820. Died in Upper Alton, Ill., May 20, 1890. In his early years taught school in Kentucky and Missouri; afterward studied medicine, graduating from the Berkshire Medical College in 1847. Surgeon of an emigrant train crossing the plains to Santa Fe, N. M., in 1849. Filled the first teeth ever filled in the territory. Afterwards practiced medicine and dentistry in Warsaw, Ill. At the breaking out of the War of the Rebellion served as acting assistant surgeon on hospital steamers on Mississippi river. Was appointed surgeon of the 40th Mo. Vols., and was at battles of Nashville and Spanish Fort. Served until after close of war. Then commenced practice of dentistry in St. Louis. Organized the Missouri Dental College, and was president of St. Louis, Missouri and American Dental Societies, and an active and honorary member of this Society and various medical societies; also member of Illinois State Board of Dental Examiners.

Dr. William Henry Eames. Born at Auburn, N. Y., Aug. 23, 1828. Died at St. Louis, March 29, 1894. Dr. Eames studied medicine at Ann Arbor, Mich., and graduated in dentistry from the Ohio Dental College in 1853. He located in St. Louis in 1862, remaining in active practice up to within a few days of his death, or for over thirty years. The Doctor was one of the organizers of the Missouri Dental College, and remained an instructor in the school up to the time of his death. He was a member of the American Dental Association, and had been president of the Missouri State, city and other dental societies. Honorary member of this Society. It is not necessary to speak here of the genial nature of Dr. Eames.

Dr. Henry S. Chase. Born in Vermont, March, 1820. Died in Benton, Mo., January, 1898. Dr. Chase graduated in medicine. Afterwards attended the Baltimore Dental College and engaged in dental practice. Was a professor in the Missouri Dental College; was editor of the *Missouri Dental Journal*; member of State and American Dental Associations. An honorary member of this Society. Was the first to use a local anesthetic in preparation of

teeth for filling—this in 1850 and '51 (see *News Letter*, Vol. IV, page 23).

Dr. William N. Morrison. Born Ohio, May, 1842. Died, December, 1896. Dr. Morrison was a graduate of the Ohio College of Dental Surgeons, president of the Missouri State and St. Louis Dental Societies, honorary member of the Illinois State Dental Society. First made gold crowns, which he described in 1869. Wrote many articles on transplantation and replantation of teeth and other subjects. An excellent operator and a mechanical dentist of more than ordinary skill. Contributed in many ways to the advancement of dentistry.

Dr. Henry J. McKellops. Born near Syracuse, N. Y., 1823. Died at St. Louis, April, 1901. Graduate of Ohio Dental College. Member and first president of Missouri State Society. Also member of St. Louis, American, Southern and National Dental Associations, and president of all except the last. Widely known as an operator, always in attendance upon the different society meetings, and probably personally known by more dentists than any other man in the profession. Honorary member of this Society.

Dr. Christopher W. Spalding. Born in Rhode Island, 1814. Died at Riverpoint, R. I., June, 1896. Dr. Spalding in the early years of his practice, was intimately acquainted with Drs. Dwinelle, Westcott and others of that coterie of leading dentists. He came to St. Louis in 1849, where he continued in practice for many years. He was president of the American, Mississippi Valley, Missouri State and St. Louis Dental Societies; Editor of *Missouri Dental Journal* and the *Archives of Dentistry*, and connected with the Ohio and other dental colleges.

Dr. Edgar Park. Born in Wainfleet, Ontario, 1840. Died in Middleton, N. Y., 1892. Dr. Park was the first secretary of this Society, 1865-66. Was secretary of the American Dental Association; president Missouri State and St. Louis Dental Societies. Was among the first to restore teeth by building up with gold foil, and one of the best operators of his own or any other time.

In closing I wish to call your attention to this fact—that everyone whose portrait I have presented this evening was an active agent in advancing the dental profession. Since the formation of dental societies they have been among the foremost in disseminating the knowledge they gained from practical experience. From their skill

we have advanced in methods of manipulation, and from their investigations we have been able to establish ourselves as a recognized profession. Another thing you will notice—that advancement seems to come from different centers at different times, changing from one section of the country to another.

I wish to express my obligations to Dr. Chas. McManus of Hartford, Conn., for several of the photos and engravings which I have used in getting up slides, and for information which he has kindly furnished me.

Discussion. *Dr. G. V. Black*, Chicago: These are the names of our illustrious dead. I cannot well undertake to discuss this paper in the more serious sense in which it presents itself, so prefer to recall some of the men and speak of them in a lighter strain.

John Tomes. I believe he did more for the dental profession than any other man who has ever lived, for he made us acquainted with the minute anatomy of the teeth, and opened up the way to a knowledge of the whole subject of dentistry. He is known in this country only through his writings, but he is revered in England for his wonderful force of character and for the influence his personality exerted in building up the dental profession.

Chapin A. Harris. I would say of Harris in America as I might have said of Tomes in England—that the dental profession grew up around him. With his associates he founded the first dental school, and he separated dentistry from medicine and started it upon a career of its own. His influence had much to do with the publication of a wonderful journal of his time, and men subscribed for from five to fifty copies each at \$5.00 a year, in order that the journal might thrive. How many do that to-day? This illustrates something of the power of the man in that day when dentistry was young.

Robert Arthur. He wielded a great influence over dentistry by the study he gave to the surroundings of decay. His particular style of cutting teeth so as to place self-cleansing surfaces, and thus prevent the recurrence of decay, has fallen into disuse, but his work attracted the attention of the profession to the subject. He was practically the first man to introduce cohesive gold foil.

Dr. Watt. He was a good debater and a strong writer. Although he wrote well upon other subjects, I remember him best for his papers on chemistry.

Dr. Morgan. He was a man of wonderful force of character, of

excellent judgment, a skillful operator and one of the good men of the profession.

S. S. White. We know him of course as a dealer in dental goods, but those who came into close contact with him knew quite another side. He was a man of very broad knowledge and of sterling character.

Marshall Webb. It was certainly a keen regret to those in the profession who knew him that he should have died so young. He was a splendid young man, and one of the most brilliant that we have ever known. He had studied caries and the teeth very closely, and had he lived longer he would undoubtedly have put his thoughts into language that would have impressed the profession much more than his mere operations could ever have done.

Dr. Atkinson. He was widely known through his wonderful power of impressing men by the use of language. He and I had many a tiff, as in society meetings we generally disagreed pretty strongly.

M. S. Dean and Geo. H. Cushing. I always associate these two men, and during the life of Dean they were seen much together. It was about these two that the Illinois State Dental Society grew up. We might say that Dr. Cushing was its father. We revere him not so much for what he has written, but for the influence of his noble character.

Dr. Patrick. On account of some peculiarities in his character he never showed up for what he was worth. Furthermore, he was stronger in other lines than in dentistry. He would not brook opposition, and this prevented his being as well thought of as he deserved.

A. M. Leslie. Perhaps few of us remember him, as he died in 1866. He was a genial man and did some good work, among other things, publishing a dental journal.

Henry Peebles. Perhaps no man in the early days of dentistry attracted me more than he did. I always felt that I could trust him or go to him with any question. He was genial, kind-hearted and earnest.

Dr. Forbes. He was a man of sharp, terse speech. I remember an incident which occurred when rubber dam was first brought into use. In those days we had a great deal of difficulty in fastening it onto the teeth. I was describing before a society meeting a

peculiar knot that I said would never slip, and Dr. Forbes took the wind out of my sails by saying, "Better let it slip a time or two."

Dr. Judd. Here was a man who worked too hard, studied too much, and who injured himself by his devotion to the profession. He had a lucrative practice in St. Louis that was ruined by the terrible panic in the early seventies. He was one of nature's noblemen. I always associate him and Dr. Eames, and they worked much together. Dr. Eames was a true, earnest man.

Dr. McKellops. Perhaps he is so well known to us that it is needless to speak of him. He was very successful in practice, a wonderful operator and a true Southern gentleman. When he started his practice patients were few and far between, so to bring in more patronage he put his smallest fee for filling a tooth at \$10, and in a short time had a lucrative practice. This illustrates somewhat his impulsive character.

Dr. J. N. Crouse, Chicago: I would speak of only two men, namely, Drs. Dean and Cushing. I probably knew them more intimately than anyone here, because I practically lived with them for several years. Dean did not appear so active, but he was really the guiding spirit among us. He was one of the cleanest, most unselfish men I ever knew. He had heart trouble and always feared he would die in the night. He was a bachelor, and years before his death made me promise to personally look after his burial. He was found dead in bed, just as he had predicted he would be, and the funeral was held at my house.

Dr. Edmund Noyes, Chicago: I did not know Dr. Dean as Dr. Crouse did, but I admired him greatly. Whenever a quarrel was imminent or a discussion began to grow acrimonious in a society meeting, he would say a few words and bring everybody together in peace. He was essentially a peacemaker, and a man of great strength of character, of fine education, and of much refinement of thought and feeling.

Dr. F. H. McIntosh, Bloomington: I personally loved Dr. Cushing and revere his memory. I would be an ingrate indeed if I did not speak a word in honor of my old dean, Dr. J. E. Garretson. As you looked into his kindly face you could not help but know that young men under his teaching would be benefited in more ways than one. He was a writer of many helpful books.

MATRIX IN COMPOUND-APPROXIMAL GOLD FILLINGS.

BY ELLIOTT R. CARPENTER, D.D.S., CHICAGO. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

It has been often said that there is nothing new under the sun, and in a measure the old saw is correct. There is very little that is new to everybody, but by virtue of the fact that no one man is capable of knowing everything, there are probably some in this body to whom part at least of this paper may be new, and to them I gladly commend our old friend, the matrix, in compound-approximal gold fillings.

There are many varieties of matrices on the market, the principal ones being the Jack, Brophy, Miller, Woodard, Guilford, Ivory Retainer Nos. 1, 2 and 3, Creager, Ladmore-Brunton, Meister and Powers. Every operator will use the one most adaptable in his hands. Personally, I prefer the Ladmore-Brunton Matrix, made by Ash & Son of London. I find it the most adaptable to all classes of compound-approximal cavities, irrespective of whether the tooth to be girdled is normal or abnormal in its shape and contour. This matrix is very rigid when properly adjusted, and not nearly so cumbersome and in the way of the operator as many of other designs. It is composed of a screw clamp, nine spring-steel bands, and a spiral or flexible wrench to draw the bands taut around the tooth to be operated upon. The screw clamp or band-holder consists of a square-headed screw running through two small jaws, each having an extension hook which grasps the band at either end at point where hole is punched. A smooth round bar is brazed into one jaw and slides freely through the opposite jaw in a parallel line with the screw, which keeps the jaws from buckling and forces them together at the same angle when the screw is turned up. I do not use the bands which come with the set except as patterns, since I find them too thick and unyielding. The best band material I have found is the bronze metal manufactured by Dr. A. C. Hewett of Chicago. It is capable of being rolled very thin and is exceedingly tough, which makes it an ideal material for matrix bands. It is my practice to have a lot of these bands made up of different lengths, widths and shapes as blanks ready to punch the holes in the ends when cavity is prepared and measurement is made of the tooth to be filled. Right here let me add, when making up extra bands or blanks, cut the first third of the gingival edge of the band with a convex curve, so that the

band at this point will reach well down below the cervical margin, and the last two-thirds of the gingival edge of the band with a concave curve, so when the band is drawn taut it will hug tightly the neck of the tooth and flare toward the occlusal edge, which allows space within the band for proper contour of filling.

The advantages of the matrix are many. Large operations may be performed with a great saving of time, and much less space is required. The filling is practically finished at the cervical margin when the matrix is removed. It is not necessary to separate for several days before operating, so the teeth are not sore and tender to the touch, consequently it is a humane method to pursue, and it is seldom necessary to use finishing strips, which are exceedingly irritating to most patients. To hypersensitive and very nervous frail women, and also for children, I think the matrix operation positively indicated.

For the sake of convenience, and to avoid confusion of terms, we will consider compound-approximal cavities in molars and bicusps of the inferior maxilla only. Dr. C. N. Johnson in his late work, "Principles and Practice of Filling Teeth," has, in his chapter on cavity preparation, given us the most comprehensive, scientific and practical article the profession has ever received, and it is not my intention to crib from his book the underlying principles of cavity preparation which he has so tersely and intelligently given us, but I will merely add a word of warning—do not make a long bevel on enamel margins at any point where they are brought in contact with the matrix band, as the result will be the formation of a V-shaped space, into which it will be found difficult to properly and surely condense gold, but make the bevel short, so that it and the band will produce almost but not quite a right angle.

The rubber dam being adjusted, select a band of proper length and curve to conform to the tooth and its ultimate contour. Slip the narrow end of the band between the teeth opposite the small occlusal end of the cavity, drawing the large end of the band around the tooth lingually and over the approximal margins of the cavity already prepared, and clamp tightly to place, holding the cervical edge of band in close contact with the cervical margin of cavity while the clamp is being tightened, so as to make sure the dam is not caught between the cervical edge of band and that of the cavity margin. Now trim a triangular-shaped wedge to fit the interdental space,

making the wedge about a half inch in length, and force from the lingual side well to place, separating in this way enough to overcome a little more than twice the thickness of the band. Now carefully go over the enamel margins in contact with the matrix with fine right and left exploring instruments to make certain that the wedging process has not in the slightest degree crushed or marred them. Having thoroughly wiped both cavity and matrix with carbolic acid and alcohol, dehydrate thoroughly, and the cavity is ready for insertion of gold. I find a small clamp mouth mirror, attached in starting these fillings, of great service and convenience in lighting up the bottom of the cavity, as it allows the operator the opportunity of using an assistant instrument in the left hand to keep filling from rocking until gold has been well wedged and condensed to the buccal and lingual walls. I use large, coarse, serrated pluggers and unannealed gold pellets of large size, malleting them well home after the cervical border has been covered by a sufficient cushion of gold to admit of thorough condensation without possible injury to the margin. After condensing the gold at the cervico-buccal and cervico-lingual angles, I use single and double-lined pluggers of the bayonet-shaped type, and where space and position will admit, single-lined chisel-shaped pluggers, working my gold well up from the center onto the lingual and buccal under-cuts with double-lined rocker-shaped pluggers.

Keeping my filling hollowed out or cup-shaped in the center, I now build up about two-thirds towards the occlusal surface with unannealed pellets. Two-thirds of the approximal wall of the filling now being completed, I start with smaller pellets of slightly annealed gold in the occluso-buccal and lingual under-cuts, malleting well into the unannealed gold until I meet in the center, completing the operation from now on with more heavily annealed gold until I have reached the top of the matrix and into the occlusal portion of the cavity, taking great care to condense the gold firmly against the matrix and forcing it hard enough against the approximating tooth to loosen the wedge. When this is accomplished you may be sure that the resulting gold contour will be sufficient to more than overcome twice the thickness of the band, and to allow enough for finishing the knuckle point without leaving a space when filling is polished and the matrix removed. It is my practice to burnish over the occlusal margins with a rotary engine burnisher well armed with

soap suds, which aids condensation and obviates plating the burnisher, which tends to tear and drag off portions of gold at the margins. Now remove wedge and matrix and burnish thoroughly over the gingival margin with right and left sickle-shaped burnishers, and it will be found that the soft gold, which has been forced well over the margins at this point, can be rubbed down hard, smooth and shiny, and seldom is it necessary to use finishing strips at this point of the filling. I now adjust a double-bowed Ivory separator, tilting it so that the anterior bow rests on the occlusal edges of the teeth, and slip a small piece of wood under the distal bow, which will allow the jaws or points of the separator to settle to, but not impinge upon, the gum. This can be regulated to a nicety according to the thickness of the piece of wood placed under the distal bow. The separator is now turned up gently until just enough space is produced to admit a coarse ruby or sandpaper disk, and it goes without saying that all disks should be well vaselined and revolved in the engine buccally when working on the buccal margins, and lingually when working on the lingual margins. In other words, the disk should always be revolved in the direction to draw the gold over the margins and never away from them, and right here I want to say that I thoroughly believe the margins of many well inserted fillings have been seriously injured by either unintelligent or careless disking. With a sweeping side movement of the handpiece the coarse disk is made to trim off the buccal and lingual excess or overhanging gold. Fine sandpaper and cuttle-fish disks are now used lightly over the knuckle or contact point until the margins and all of the approximal surface of the filling are perfectly finished, ending up with a drawing or pushing movement of the disk (according to whether the approximation be anterior or posterior) from the point just above the knuckle to the occlusal surface. This will round the filling from contact point up and onto the occlusal surface. The occlusal margins may be now finished with stones, burs or disks, according to each operator's fancy. The separator has been left on until finishing is completed, because the tooth being wedged tight against its neighbor is less tender to grinding upon its occlusal surface. Now remove separator, allowing tooth to spring back to its normal position. It will be found upon passing the floss between filling and tooth approximating it that the contact or knuckle point has been perfectly restored, which will preclude entrance of food.

Discussion. *Dr. C. P. Pruyn*, Chicago: The essayist stated that the sandpaper disk should always be revolved toward the edges of the filling and not away from them, for fear of drawing the filling material away from the margins. I wish to state very emphatically that any filling which can be injured in this way would better be injured and then removed.

Dr. L. S. Tenney, Chicago: The essayist stated that in the preparation of cavities where we are going to use a matrix we should avoid too long a bevel at the point where the margin of the tooth is to come in contact with the matrix. Now all cavities should be prepared upon certain recognized scientific principles, and should not be made to accommodate the matrix, but the matrix should be adapted to the cavity. If we cannot use the matrix with the margin properly prepared we would better dispense with it altogether. We know the extent to which enamel margins must be beveled in order to secure the greatest permanency and strength, and this must be done at whatever cost. Personally I rather condemn the use of the matrix.

Dr. J. N. Crouse, Chicago: It is poor practice to use a matrix when filling teeth with gold. Look at those tubes that were filled in the clinic with amalgam and see how many operators broke the edges of tempered steel tubes. With that method of condensing gold at the cervical margin places would be chipped and not seen at the time, but they would later work harm. I am a firm believer in the use of non-cohesive gold cylinders at the cervical margin for starting all proximal cavities.

Dr. T. W. Pritchett, Whitehall: I use steel-handled gum lancets of various sizes and shapes, with very sharp edges, for shaving down the overlapping edge of a gold filling near the margin. These instruments are even more valuable for carving and shaping fillings of other materials.

Dr. Edmund Noyes, Chicago: I don't use a matrix very much, being somewhat afraid of it. Furthermore, when using one it has always seemed necessary to get over the border of the cavity so that the gold could be wedged down between the cavity border on one side and the matrix on the other, in the same way that you would get gold against the two sides of a narrow fissure. There is more surplus to be disposed of after filling a cavity with a matrix than when it is not used. A matrix is a help in distal cavities which are broad and shallow at the cervical margin. When the filling is finished it must

be polished, especially at the cervical margin, and I don't know anything better for the purpose than strips with the same degree of cutting quality as the disks with which the other portions of the same filling have been polished. By using successively finer grades, and finishing with first pumice stone and then chalk carried upon silk tape, all scratches will be removed and you will have a finely polished surface.

Dr. Carpenter, closing discussion: It was distinctly stated in the paper that the first third of the cavity was filled with non-cohesive gold, and I still maintain that a disk revolved away from the margin of that filling is apt to tear it, no matter how well it is condensed. I stated that I followed as closely as possible the scheme of cavity preparation formulated by Dr. Johnson, with the slight modification of a shorter bevel, and in so doing I do not think that I have violated the principles of proper cavity preparation. I have been using the matrix exclusively for nine years, and many fillings nine years old are still doing good work at the cervix. I always condense the gold with a mallet at the cervix and it can be done so thoroughly that there is little more need for the burnisher after the matrix is removed.

PRELIMINARY DENTAL EDUCATION.

BY M. R. HARNED, D.D.S., ROCKFORD, ILL. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

The idea of writing a short essay upon this subject was suggested by a discussion which occurred during the meeting of this society held at Rockford last year. The point under discussion was the rule, with its perplexities, existing between reputable dental college faculties, which enables a student who has taken one year's work and passed examinations thereon in one college, to demand entrance to the next year's course in any other college without examination.

This naturally raises the questions of preliminary qualifications, natural adaptation, moral character, thoroughness of examinations, desire to get students, and even the qualifications of examiners, together with many others. The discussion indicated an attempt to eliminate competition in a very crude way which was highly unsatisfactory.

This discussion, together with the rivalry among dental colleges, the strong competition for students, the sharp sparring and bicker-

ing between members of different college faculties, which is neither interesting nor instructive, helpful nor dignified, has prompted me to write this paper, which is intended to be somewhat philosophical and critical, but in no sense personal.

By preliminary dental education I mean all education previous to independent practice, to distinguish it from dental practice and society work, which is all educational. And I wish first to go briefly into the philosophy of general education as it is a part of and preparatory to dental education. All philosophy to be true must go to the root of things, must be based on fundamentals, hence I start with a quotation from a friend, which has never appeared in print so far as I know. It is this: "All true philosophy must be based upon a true understanding of economics." This is because the first question to be settled by all people individually or collectively is "how to live," so all philosophy, whether religious, ethical, political, educational or what not, will be modified by the philosophy as to "how to live."

If we start with the proposition, "Every man for himself and the devil take the hindmost," we allow selfishness to dominate, and religiously we gain heaven for ourselves if we have to send all the rest of the human family to hell to achieve it; ethically we will be selfishly warped, unjust; politically we will go in for emolument and spoils; educationally, to gain advantage by superiority of opportunity over our fellows. If, on the other hand, we start from an understanding of economic principles, which recognizes the other fellow's right to live, and an equal right to opportunities, we eliminate selfishness, and religiously we gain heaven by helping others to gain it; ethically we will love and practice justice; politically be true to our principles; and educationally we obtain a higher ideal of its benefits which we gladly give to others. Your consideration is asked of its influence educationally.

The dominant American idea of "How to live" is expressed by David Harum in his version of the Golden Rule: "Do unto the other feller the way he'd like to do unto you—an' do it fust." The result is, that if you ask the average man why he is giving his son an education, his reply will be, "So he won't have to work as hard as I do." Is it true that education is to prevent men from working, or disqualify them for labor? In many cases it does, and this is largely due to the fact that they and their fathers started with the

wrong idea of how to live. Then there is the idea of entering the better classes, the exclusive class, which lives from the work of others, in which are those who live by their wits, brain work, looking after political emolument and special privileges, regulating prices of produce, manipulating stocks, wrecking corporations, and other similar pursuits.

If every man could realize that it is his duty to work, otherwise the burden falls upon a brother; that the greatest of pleasures come from work, from rendering faithful service; that work is our source of health; then education would no longer be given or accepted with the idea of escaping work, but of being able to render more efficient service, and getting more pleasure from same. If every man could have this ideal of education and its uses, an individual would not enter the profession of dentistry or any other because he liked the hours, or because of the social standing, or because he had a father rich enough to give, or a friend foolish enough to lend him the money. On the contrary, he would enter it because he felt this the best way to render service to his fellow men and solve the problem "How to live." A man's work should in some way be an expression of part if not all of his ideals. This is what Dr. Cormany calls success. To someone else it might be failure, because it does not make vast wealth, nor gain control over the lives of others. We are so apt to reckon success by the amount of power over others.

Man's work begins, so far as we know, at his birth, first educating his parents and then expressing himself. Froebel struck the keynote of education in his kindergarten (child garden) idea—simple growth, development, expression. He demonstrated that education should be *expression*, not *impression*, and his thought has been amplified until it has revolutionized the whole educational world. Instead of teaching a child twenty-six abstract characters he taught it to observe objects, and when it desired to express the observation it was taught the combination of characters necessary, without special reference to the characters. After using them to express many observations, they became familiar without any special effort on the part of the child. All is observation and interest from the start.

In Felix Adler's model school in New York and in many schools in New England this principle has been applied with wonderful effectiveness. Through systems of manual training it is constantly being worked out, giving the youth the opportunity to discover his natural

bent and to know how he most naturally expresses himself, and he naturally develops along that line, so that when he has been in school for a term of years he will not have simply a mass of abstract ideas, but will know by practice their application. Someone has said that "One can't be sure of knowledge until it is applied or imparted." How much better prepared he will then be to select a line of work which will express his nature, and make him serviceable not only to himself but to all society. The teacher will not then be entering mechanics, the farmer will not try to be a politician, the horseman will not attempt to become an accountant. In other words, we have learned that we "Cannot gather figs from thistles," nor "Make a silk purse from a sow's ear," and we understand that remark of Hubbard's in a late number of *The Philistine*, "The Kindergarten is the greatest scheme ever devised for the education of parents."

You can all see at a glance that this preliminary preparation is just as important to the teacher in a profession as the student. Teachers would then be selected because of qualifications, rather than because they could be hired cheaply, or dared not go into the world to build up a practice for themselves. Many can teach who cannot practice, many can practice but cannot teach. Why then do we not follow our natural bent, why do not colleges follow out the idea of expression, and select teachers because of fitness? Principally because, owing to the law of competition, the schools can afford to hire only a few high-priced men, and this is due to the fact that they are organized principally for profit, incidentally for education, and must be made to pay. This leads to the usual method of having a nucleus of competent men, with subordinate positions filled by incompetents, men who can be hired cheaply. It leads to hustling for students and getting in those who will never be able to express through this profession. It leads to careless preliminary examinations, or none at all. It leads to keeping young men at it, and finally graduating those who are unfit for the profession, instead of trying to help them to find their place, for no college can afford to get the reputation for plucking many. It leads to extending the years of the college course, and getting more work and money from students, thus putting a hardship upon the man who has the ability to do the work in less time.

In other words, while our lower forms of education are on an

ethical basis, our colleges, as a rule, are on a commercial plane. Why is it so? Because we who have money enough to afford our children a higher education desire to give them a special privilege, special opportunity, which are not accessible to the masses, thereby placing them in the better (?) classes where "they won't have to work so hard." Do you think this is not true? Did you ever stop to analyze the motive of higher education? If this is not true perhaps you will tell me why we have not voted to establish public colleges, supported by public tax, where all would be privileged to have higher education.

These remarks indicate what I consider the remedy for the evils which were under discussion a year ago, or rather, since higher education was established, and always will be until we have public colleges. No! until we have national or international public colleges. Then and then only will the commercial competitive element be done away with, and we will have only competition for efficiency. Not all men in college faculties will then be equal, but each will be the best procurable for the place. There will be no pressing in of students who are not naturally so inclined. The preliminary examination will be especially intended to determine adaptability and proficiency. A mistake in choice of profession (which would not be so likely to occur) would be readily corrected if money considerations were cut off. The college years would be extended only for those who needed it, for instead of having a three or four years' course, it would be a prescribed curriculum of study and the candidate would graduate when he completed the course to the satisfaction of teachers, who would be interested only in the welfare of the student and community. We all know that one man can do a piece of manual labor in less time than another, and it is just as true of intellectual tasks. Why then should all be compelled to put in an equal number of years? The proposition seems absurd, viewed in this light. The adoption of this idea will, I hope, be the means of regulating graduation or promotion throughout our whole educational system.

I have been somewhat critical of our dental colleges, but I have not pointed out one defect which the members of the various faculties do not recognize and deplore. My object is not to protest against the present institution, but by pointing out its defects, and giving remedies for same, to promulgate a philosophy of justice and equality of opportunity.

But I would not pass without paying a deserved compliment to dental college education. Despite the criticisms made, which apply to all college education, it would be unjust not to mention the fact that with the exception of one profession (that of the nurse) they are all hopelessly deficient in expression, compared with dentistry. Not one of the others devotes one-tenth the time to expression which the dental colleges do. Their faculties have done wonderful work in this line and deserve unlimited praise for it, and we are proud to be members of a profession which has taken such advanced ground in educational matters. It seems as if other professions would have to come to this idea very soon and put it into practice.

The criticisms of this paper are not directed against the present institution, except as it illustrates the defects of the present system, because it is recognized that under it these deficiencies are inevitable. They are intended especially to arouse an interest sufficient to investigate and recognize the awful defects of our competitive system, which makes not only these things necessary, but a thousand others which are still more terrible, and the feeling is that the members of the dental profession, so advanced in educational matters, should be foremost in trying to remedy the system.

If you want to know the fallacies, nay, the crimes, of the system, read "The Parable of the Water Tank" in Bellamy's "Equality." If you want to know the remedy read Tolstoi's "What is to be Done," of which Jane Addams in a recent address said that to her "there were two classes of people, those who had read it and those who had not."

But someone says "Let well enough alone," or "you are trying to introduce the millennium through your imagination." To the first we would reply, "Let well enough alone" is the motto of the sluggard, the one without imagination. He is the conservative (because he conserves wealth—usually for himself), who, sitting by his fire, with his door shut, cannot imagine but that all the world is warm, and if he has had a good meal cannot conceive of anyone else being hungry. He lacks imagination. To the other we would reply, we are perfectly willing to have the millennium come if that means justice, or equal opportunities for all. We admit this is an ideal, but the ideals of to-day are the realities of to-morrow. When Besant wrote in his "All Sorts and Conditions of Men" of "The Palace of Delight" it was imagination, but the result is a reality to the people of Lon-

don's East End. When Jules Verne wrote of his Nautilus with its incandescent lights it was a dream, but now is realized.

When Froebel promulgated his idea that education should be *expression* not *impression* it was a theory, which we are realizing upon. So imagination has always led the way; it is the torchlight to human progress, and when those who have looked beyond the confines of their own selfishness see and tell of visions, of peoples living together in love and justice, we are conscious of potentialities—a mere spark of imagination, which fanned to a conflagration would light all humanity and by its ever-widening circles move the races onward and upward, toward the Great Consciousness.

Discussion. *Dr. Edmund Noyes*, Chicago: The expression of ideals and the statement of philosophical principles are always useful, but the value of ideals is in proportion to the closeness of their relation to present conditions, and if I were to criticize this paper I should say that the road between the two is not made clear enough. The essayist suggested the desirability of taking higher education away from the independent institutions and having it provided for by the state. As a matter of fact, almost every one of the older states provides for professional education in the state university. Some of the dental schools connected with universities have such strong support as to raise them somewhat above the independent colleges, but others must take care of themselves, regardless of affiliation. Some go even further. For instance, the state of Minnesota prescribes that the dental department of the state university shall be absolutely self-supporting, and it further rules that all the matriculants must be high school graduates, which, of course, drives many students away. That is not very satisfactory state support. We must be a little patient with the private institutions, as they are raising their standard each year and are striving after better things. The essayist pleaded for an elastic curriculum that would allow students to advance according to their ability. We all know that some acquire knowledge faster than others, but the necessary limitations and economics of teaching require that the whole student body shall be carried over the same subjects together, and it is not possible for the boys to string along one at a time and receive proper attention. It is a seeming injustice for bright students to be held back by slow ones, but it is not real, as there is no limit to the training and education that a quick, bright student may acquire if he has the inclination. The amount of

anatomy, chemistry and other studies required to pass the examinations is certainly not all that a man could use in practice, so the bright students could well go beyond the curriculum.

Dr. G. V. Black, Chicago: Here in our society we learn the sentiment of the membership, but we must not forget that the majority of the men in the state do not belong, and that among the non-members are many good men. Now the state board of dental examiners and the colleges deal with the whole body of the profession and not simply with the society members, and it happens very often that students come to us well recommended by prominent men in the state, and they take the rejection of those students as a personal affront, even though they realize in sending them up that they are not eligible. In fact, I have known dentists to resort to fraudulent practices in order to get their pupils admitted. The schools dare not advance more rapidly than the profession want them to, but the men conducting schools will be glad to raise the standard as rapidly as the profession will support them. The rivalry among schools for students does no harm if conducted properly, and that is not what tends to lower the standard. Dr. Noyes is right about the curriculum, and there are many students who do two or three times as much work as is required of them. These are the men who are heard of afterwards.

Dr. G. D. Sitherwood, Bloomington: What percentage of young men entering dental colleges to-day have had preliminary work in a dental office, and what percentage enter and are graduated without any conception of the old scheme of preceptors?

Dr. Black: I cannot answer definitely, but a large proportion of students nowadays have had no office experience. However, a number come to us from the office, and all generally come through the advice of some dentist.

Dr. Noyes: I believe most students come to the schools without office experience, and the teachers prefer them to those who have had it. I also believe that those students who are not compelled to earn money between sessions are apt to spend a considerable portion of the time with some practitioner. I have long been convinced that the proper time for a pupilage is just after graduation. If the graduate would go into the office of a good man for a while he would pick up just what he needs, and he could not do this without the college training.

Dr. B. J. Cigrand, Chicago: The essayist stated that there was a good deal of fighting among the members of the faculties of the various dental colleges, but this does not apply to the three schools of Chicago, for they are on the most friendly terms. When the time comes that the Illinois State Dental Society directs and guides the dental colleges of the state we will all rejoice. All would be glad to see an executive board elected by this Society or any other legally organized body to pass on the qualifications of dental matriculants. If the members of this Society would go through the dental colleges of Chicago they would admit that conditions are not so bad as stated.

PRESENT STATUS OF DENTISTRY IN THE PHILIPPINE ISLANDS.

BY LOUIS OTTOFY, D.D.S., MANILA, P. I. READ BEFORE THE ILLINOIS
STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

It is with pleasure that I send you something for this meeting from these distant possessions of the United States, both in the interests of my many friends in the Society, and also for the reason that much inquiry is made regarding the practice of dentistry here, which can be more thoroughly answered in a communication of this kind than by a number of individual replies.

Dental Legislation.—The law now in force is very meager, and even its few primitive requirements are not attempted to be enforced. A native without a diploma would be subjected to an examination, but no natives are presenting themselves for that purpose. A foreigner or American, if he could show a diploma from some fair dental or medical institution, or a certificate of registration from some licensing body, would simply have his name, age, date of diploma, etc., entered and then be ready to enter practice. Recently an act has been drawn, approved at a meeting called by the Board of Health, to which all practicing dentists in Manila were invited, and finally approved by the particular member of the commission to whom bills of this nature are referred, and it is now ready for passage. It will possibly have become a law ere this is printed. This measure is modeled after the laws in force in most of the states. Its principal provisions are: Board of Examiners, consisting of three who must be graduates, to meet twice a year or oftener; diploma essential to

admit to examination, both being required before admission to practice; provision for temporary license, fees about the same as in most of the states; frauds, as the falsification of diploma, unauthorized assumption of titles, practice without compliance with the provisions of the law, punishable by fine or imprisonment, or both.

Dental Education.—Until the advent of the Americans in the archipelago but little attention was paid to dental education. A partial course, consisting principally of instruction in extracting, was maintained until the Spanish-American war broke out, on behalf of the College of San José, which is the medical and pharmaceutical department of the University of Santo Tomás. In December, 1900, the Manila Dental College was established, and a proposition is now pending to merge this into the University of Santo Tomás, thus adding a dental department to the almost complete curriculum of that University. There is a large field for the practice of dentistry among the natives. In fact, it is a field which has barely been touched, and one which can be made profitable to the native practitioner only.

Dental Literature.—In this department of dental science nothing whatever has been done by the Filipinos. With the development of the dental educational system it will become practically necessary to create a demand for the native practitioner. At the present time, excepting the best class of natives, no information whatever exists among the masses regarding the importance of the teeth. When the College approaches such a state of perfection that it is ready to send its students among the people, I hope that the latter will have been awakened to a sufficient extent to appreciate the worth of this entirely new (so far as they are concerned) profession. My proposition is, to rouse an interest by means of small booklets relating to dental hygiene, such as are current in the United States, and by disseminating information through brief pamphlets and leaflets, or possibly by introducing the subject into the curriculum of the public schools. Of course, such information will have to be imparted in the various dialects of the natives for some years, later on to be supplanted by the English language. Eventually, when a sufficient number of natives are in practice, there may be room for a dental journal.

Dental Societies.—No associated effort was made among the natives until the advent of the Americans. Early in 1900 the Manila Dental Society was organized. Since then, with a few exceptions, the members of the profession have been more or less migratory.

Dentists have come and gone, and very little has been done, but recently the influx of Americans has been greater than ever, and when the number resident and permanent is sufficient to make it possible to have live meetings I am of the opinion that some good will result. I have had in view the establishment of an Insular Dental Association, but the time is not yet ripe for that, as the dental practitioners are practically confined to the few centers of population, but especially to Manila. In connection with the matter just referred to, I sent out some time ago to the various provinces for information regarding the number of practitioners, and it may be stated on general principles that the provinces are practically devoid of dentists. I have made the following estimate of the number of practitioners in the islands, exclusive of those in the service of the United States Army, and I believe that the figures are very nearly correct:

Manila:

Americans (graduates)	4
Americans (not graduates, but licensed to practice in some state of the Union)	2
Americans (graduates about to locate, March 15, 1902)	2
English (not graduates, but registered in England, 1878)	1
Spanish (not graduates, one registered, one not registered in the Philippine Islands)	2
Filipinos (registered in the Philippine Islands)	7
<hr/>	
Total in Manila	18

Provinces:

Americans (graduates, said to be permanently located)	2
Americans (itinerant and members of the Hospital Corps, U. S. A., but not members of the dental corps)	6
Natives (not graduates, estimated)	10
<hr/>	
Total in Provinces	18

Total in the Philippine Islands	36
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It should be stated that there are in addition several American and Filipino dentists, some graduates, others not, who find it more profitable to be engaged in commercial business, or as clerks, etc. Furthermore, that nearly all those mentioned as regularly in practice employ one or more native or foreign assistants, the aggregate number of

which, so far as known to me, is about fifteen. Taking all the figures, in connection with the members of the dental corps of the U. S. Army and their assistants, it is safe to assert that at the present time about ninety persons are practicing dentistry, some legally, others illegally.

Dentists in the Army Service.—The dental service in the United States Army, provided for under the Army Reorganization Act of February 2, 1901, was inaugurated in these islands with the arrival of some of the appointees on June 28, 1901. The dental corps is under the charge of Dr. Robert T. Oliver, Examining and Supervising Dental Surgeon, with headquarters at the Chief Surgeon's office in Manila. At the present time the number of troops in the islands is about 41,000, and the number of operating dental surgeons is fifteen. Each one of these is provided with a member of the Hospital Corps, who acts in the capacity of an assistant, and with a first-class, complete operating outfit for all usual operations, except prosthetic work. In two instances, however, prosthetic laboratories have also been established. The splendidly equipped hospitals of Manila furnish all the necessary facilities for oral surgery. The dental surgeons are stationed at various convenient points throughout the islands, from which they make trips to neighboring posts.

Since the arrival of the corps one death has taken place. When this vacancy is filled there will be sixteen operators. The corps, while efficient, is wholly inadequate for the large number of troops, hence the immense amount of work they do is necessarily confined to emergency and other urgent cases. On an average each man performs about 250 dental operations, that is, filling, extracting, treatment, etc., per month, making a total of about 3,750 operations per month for the entire force now on duty in the Philippines.

In General.—Almost every mail brings inquiries from dentists in the states who would like to locate in the islands. It is a difficult matter to give suitable advice in these cases. In a general way it may be stated that the amount of business done by dentists has been greatly exaggerated. Some thirty years ago Dr. Stout of Chicago, and subsequently other American dentists from China ports, the West Indies, India and other neighboring countries, made visits to Manila, and sometimes to the second largest city of the islands, namely, Iloilo, and were paid what to-day would seem fabulous fees. Until 1895 or 1896 no American dentist was permanently located

here. Even shortly after the American occupation, for probably one year the fees were exceptionally good; these times are in common parlance referred to as the "volunteer days," that is, when the volunteers were coming and going. Since that time the fees have assumed moderate proportions. In fact, they are no higher than the fees in good offices in the United States, and proportionately much lower than other commodities command in Manila.

There are several dentists located here who are making and saving money, and, on the other hand, there have been a number who were unable to succeed. With the increase in Americans who are locating here in various lines of business there will be room for more dentists. The population of the islands is roughly estimated at 8,000,000; the bulk of these people will never be remunerative patrons of Americans, and Americans should not be misled by stories of fabulous wealth on part of the natives. There are some rich natives and mestizos, very few Spaniards, but none of these are educated to the American standard, hence the practice of Americans is practically limited to the foreign population. There is no city in the islands outside of Manila which, in my judgment, would enable an American dentist to make money, when it is borne in mind that the army is in some measure provided for; so the only place to locate is in Manila. The population of Manila is largely native and Chinese, Americans and foreigners (whites). Combined number at a recent census, 14,314; adding to this the better class of natives, Chinese and mixed races, there is probably a clientele of less than 20,000. Considering these figures, anyone contemplating to locate in Manila may estimate his chances.

Any who desire to come will find on my part and on part of the majority welcome into our ranks, provided they contemplate ethical practice. A complete outfit should be brought. We have no gas, and use the various kinds of gasoline apparatus for soldering. All electrical appliances should be wound for 100 volts, 16,000 alternations. Though I find that I am able to use the electric mouth-lamp, cathaphoric apparatus, furnace, etc., not wound for this current quite satisfactorily, but I know of dentists who have brought appliances which they could not use with this current. Material should be brought in quantity, especially teeth, solder, gold, amalgam, etc. While these things can now be purchased in small quantities, the prices for them are double and treble. Rents are somewhat high, and so is living,

but not out of proportion for the comforts derived. Bring no clothing except for the voyage; no furniture; books and pictures and all things that elevate, yes. Enough money to get home with in case the climate does not agree. In my case, and in that of several others, with proper care, health has been better than ever before. The climate here is simply admirable. We have all comforts, electric light, fans, ice, etc.

GONE WITH A HANDSOMER DENTIST.

(With Apologies to Will Carlton.)

BY GEORGE F. WOODBURY, D.D.S., CLEVELAND. READ BEFORE THE
NORTHERN OHIO DENTAL SOCIETY, JUNE, 1902.

John.

I've worked all day in the office, tending a nervous freak;
I've scolded my office boy till I'm hoarse; I've stood still my legs
are weak;

I've choked a dozen swears (so's not to tell Jane fibs),
When the instrument struck a nerve and the patient punched my ribs.

My instruments are all put away; I've hung up my office coat;
I've kept my assistant's salary to pay for the things he broke.
I'm cross, and tired, and hungry, things don't seem very real,
But Jane won't say to-night that I don't make out a meal.

Well said! the door is locked, but then I have a key,
Attached to a chain for safety, one of her presents to me.
I wonder who's having a party, that she's hustled off pell-mell,
But here on the table's a note, and probably this will tell.

Good God! my wife has gone! my wife has gone astray!
The letter it says, "Good by, for I'm going away;
I've lived with you six months, John, and so far I've been true;
But now I'm going away with a handsomer dentist than you."

A handsomer dentist than me! why, that ain't much to say;
There's handsomer dentists than me go past here every day.
There's handsomer dentists than me—I ain't of the handsome kind;
But a better providing dentist than me I guess she'll never find.

I've always provided the things she wanted, and bought her a ping-pong set ;

What more can she want, I wonder? Is there anything else to get?
She had dresses and hats galore, and all the new-fangled ties ;
She had everything for her comfort, yes, everything under the skies.

Oh, woman! thou art fickle, unjust, cold-hearted, cruel, unwise.
You tried your best to deceive me, but your love was only lies.
It has made me hate, yes, despise, you and all your cruel kind ;
I'll never think of you again, I've blotted you out of my mind.

As sure as the Auto kills and maims, there'll come a time when she
Will hate that "cheap John" dentist, and wish she had stayed with me.
And when her teeth decay, and an abscess grows apace,
And when he tries to fill them, and treat her swollen face—

She'll kick, and cry, and scream and make an awful fuss ;
And he'll to a back room go and rave, and stamp and cuss.
And maybe then she'll cry for me—for me—but no!
I've extracted her out of my heart, and I'll not have it so.

And when he puts on her left sup'r central a beautiful gold crown,
I wonder if she'll think him a professional man, or only a funny
clown?

I hope she'll have to wear it until she breathes her last,
It will be a sorry reminder of what she did in the past.

But no, I cannot be so cruel—I'll not wish her that awful fate ;
I'll take my harsh words back before it's forever too late.
She's too fine a woman, with her beautiful chiseled face,
To have it disfigured forever and live in eternal disgrace.

My hard old heart grows softer, my anger has flitted away.
Yes, I really think I love her, and could welcome her back to-day.
And if I thought I could sincerely offer a silent prayer,
And if I thought I had some little influence there—

I would pray for her safe return. Oh, if it could be so!
 And I'd be as contented as I was half an hour ago.
 "O God! if you want a man to sense the pains of hell,
 Before you pitch him in just keep him in heaven a spell."

(Enters Jane.)

Why, John, what a commotion here, you've thrown things every-
 where;

You have smashed my ping-pong table, and broken a rocking chair.
 And now my father's here, waiting for luncheon, too;
 I've been awheeling with him—he's that handsomer dentist than you.

You men go out on the porch, while I put the kettle on,
 And get things ready for tea. Why, what's the matter, John,
 You look so strange, so very queer! Come, what's crossed your
 track,
 Didn't you know I was only joking? I'm willing to take it back.

John.

Well, now, wouldn't that jar you; she thought I'd understand,
 But I'll never find fault again, till I know where I'm going to land.
 But one thing's settled with me—to appreciate heaven well,
 'Tis good for a man to have some fifteen minutes of hell.

REMARKS ON INFANTILE SCURVY.—J. McCaw (*Brit. Med. Jour.*) says that in most of these cases the diagnosis is not hard to make, but where the classical symptoms are wanting or only one is present it may be safe to give some definite answer if asked for a diagnosis, and refers to a case which was brought to him; the child had been fed upon condensed milk and patent cereals for ten months. The baby had vomited blood, and there was a slight diarrhea in which there was altered blood. There was complete absence of other symptoms. Orange juice, 1 dram every two hours; small quantities of whey and cream at varying intervals, with a teaspoonful of beef-juice every four hours, comprised the treatment. At the end of one week the whole condition was changed and the child soon recovered completely. Fowler's solution was given during the rest of the treatment.—*Medical News*. [The classical symptoms of infantile scurvy are: Anemia, tenderness of the lower extremities, subperiosteal hemorrhage, the presence of colored spots resembling bruises about the limbs and chest, swelling and sponginess of the gums, and a tendency to hemorrhage. The use of orange juice is especially indicated in the cases like the one above described, as lemon juice is likely to increase the gastric irritability.—Ed. *Cosmos*.]

Digests.

RESTORATION OF THE INCISIVE EDGES OF THE ANTERIOR TEETH WITH PORCELAIN. By L. E. Custer, D.D.S., Dayton, O. This operation is not new; however, the details as herewith presented may possess some merit. Cases of fracture and defective development of the enamel of the incisive edges of these teeth generally call for restoration without the removal of the whole crown of the tooth. Conditions indicating a porcelain tip are those happily medium between a small gold operation and a full porcelain crown. This operation is not advised where but a mere film of porcelain would restore the contour, for a gold and platinum filling would

FIG. 2.

FIG. 1.

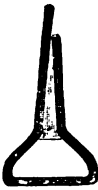
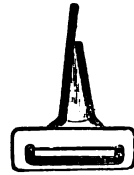


FIG. 3.



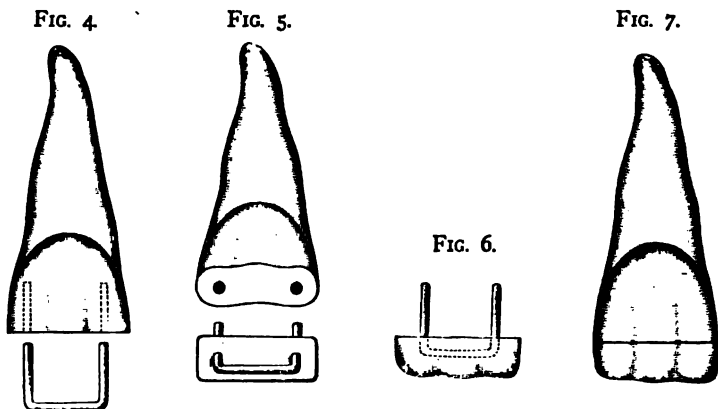
there be better. *Porcelain to have strength must have bulk.* Veneers, thin pieces and edges in exposed positions are the ruination of porcelain work. The indications for the practicability of a porcelain tip are where from one-fourth to one-half of the crown is missing.

The first step is the dressing of the edge of tooth with a stone to a symmetrical outline. A straight line across the labial surface is better than a curved one in this work. The second step is for the anchorage of a single pin if the tooth is pulpless, or a U-shaped staple if the pulp is alive. Where the pulp is absent the pin should be shaped as shown in Fig. 1. This is easily effected by bending a piece of 20-gauge platino-iridium wire upon itself and filling the point with solder, gold eighty parts, platinum twenty parts. The enlarged end should be almost as wide as the dentin at the edge, and the solder should not entirely fill the loop, for reasons that will appear. The pulp-canal should be enlarged laterally to receive the large

end of the pin up to an imaginary point where the horizontal wire will come about the middle of the completed tip, as shown in Fig. 2.

A piece of platinum foil, a little larger than the end of the tooth, is slit in the middle to receive the pin. This is placed on the end of the tooth and the pin pushed through to its seat. The two are then united with the smallest bit of pure gold that can be handled. (Fig. 3.) Only one wire need be soldered in this manner. The piece is then returned to the tooth and the platinum carefully adapted to the end. If platinum about twice the thickness of that used for inlay work be used it will be found easier to manage, and the extra thickness will not materially affect the final fit in this operation.

In those cases which present with a live pulp the following course



is to be followed: Two holes are drilled with a No. 2 bur in a parallel direction between the pulp and the enamel to about the depth indicated in Fig. 4. These holes should both be drilled at the same time by making purchase with the fingers on the neighboring teeth and lifting the bur from hole to hole, alternately drilling a little in each. In so doing the holes will be parallel and of the same depth, and there will be but little pain.

A U-shaped staple, of 20-gauge platino-iridium wire, is bent as shown in Fig. 4. This is fitted into the holes and the ends are cut off to such a length as to bring the horizontal part to about the middle of the completed tip. A piece of platinum, as before described, is placed over the end of the tooth and punctured over the holes in the dentin. The staple is then forced to its seat and the whole removed, and soldered at one end with a small particle of pure gold.

(Fig. 5.) It is then returned to the tooth and the foil adapted to the incisive edge.

We now have what may be called the matrix for the porcelain tip for either a pulpless or a live tooth. Porcelain of a dark yellow color, "Close," fine ground, or "Brewster" body No. 13, is now packed about the loop so as to represent the dentin of the tooth in color and contour. This is baked, the piece fitted to the tooth, and the edges of the platinum again adapted to the enamel. It is then removed and porcelain to match the neighboring teeth is added, to the extent of over-contouring. It is then fused. If the over-contouring of this layer has been sufficient, the shrinkage will have reduced it to about the proper proportions. (Fig. 6.) The platinum is then carefully stripped from the porcelain, and after dressing a trifle from the ends of the pins to compensate for the thickness of the platinum matrix, the piece is set with cement in the usual manner and dressed. (Fig. 7.)

Such an operation, if the porcelain be not too thin, will not only present a good appearance, but will be quite as serviceable as any other method of restoration. It is much easier performed than the average porcelain inlay and the discouraging shadow problem is not present to any extent.—*Cosmos*, October, 1902.

ETIOLOGY OF ALVEOLAR SUPPURATIONS. By Dr. W. H. Birchmore, Brooklyn. Suppuration anywhere is sufficiently annoying, but when it seats itself at the root of a tooth, it is, judging by a personal experience, simply—let us say that it is very interesting. Not only is the congeries of symptoms interesting by reason of the pain and nervous disturbance, so utterly out of all proportion to the pathological importance of such a lesion, considered from the surgeon's standpoint, but the symptom picture finds an added interest in the views which find expression in professional writings. Formal treatises on pathology and casual contributions to the journals alike give evidence that either the lesion has not been studied scientifically, or that the men who write having, it is presumed, studied it properly, refrain from drawing the conclusion, logically obviously necessary from the premises which they so fully discuss and so accurately state.

Etiology of Alveolar Abscess.—The views held by the various writers may be classified, judging by their printed words alone,

much as follows: (a) It is a disease of nutrition. This view regards the fact of suppuration as the chief symptom, and considers it of value as an evidence that the general health of the patient is in a bad way and thus only. (b) It is a local manifestation of a widespread disorder of the blood. First, the influence of the suppuration bacilli is acknowledged, but it is held to be secondary; the condition of the blood is given first place. The contention is made that if the blood were in proper condition, phagocytosis would relieve the focus and all would be well. Secondly, this view also recognizes the influence of the suppuration bacilli, or rather perhaps cocci, but at the same time holds the blood to be the true locus of the disorder. It contents itself with saying that "in this condition of the blood any trifling injury becomes a focus of suppuration." There again the blood is called into the discussion of causes, and it is held "that the condition of the blood is the first cause of disease." Third, this view implies that the suppuration cocci are at all times present in the blood, that the phagocytes are always engaged in destroying them, but in this case in some way the villains always escape the policemen. (c) In this version, seldom held and still more seldom voiced, someone dares to say that the cocci are intruders from outside, and the suppuration is the body's battle to expel the invader.

In nearly every paper which I have read, and in nearly every book which I have seen which had any pretense of value at all, I have found the same state of things. Either an implication that the invasion of the cocci was from the side of the blood circulation, or a complete negation of the causative relation of the cocci. In every case but one the final fault stands charged against the blood as a sin of omission or commission. Against this view are many and weighty objections, which seem to me to amount to a demonstration that the conclusion logically necessary from the facts of the case now in the hands of the profession should be without hesitation drawn, and should be promulgated without regard to the reputations of those who think unreason. We find on every side the hypothesis that the diseased action finds origin in a condition existent on what may be called the blood or the circulation side of the tissues, treated as an axiom. The utmost claim which can be granted is that it is a mistaken postulate.

Causes of Suppuration.—Again and again the surgical profession at large has insisted that there are many forms, causes and occasions

of suppuration, but one by one these have been eliminated until it is now possible to say positively that no form of suppurative disease exists in which the immediate cause and agent is anything else than one or the other of certain figured elements, probably all of them vegetal in origin and nature, only one now remaining in doubt, that of the suppurating disease called smallpox. Furthermore, the pathologists have carried their studies to the point where, given the suppurative disease, they can tell almost at sight its cause, and they have experimented with these causes until they can tell just what form of suppuration will follow if a given species of microphyte is inoculated upon an animal body, be it in a condition of health or in a condition of reduced vitality. So far have these studies gone that we can say beyond a doubt or question, "without these foreign figured elements, these vegetal intruders, if you will so regard them, there is no suppuration, there is no pus." It may be possible to say even more and yet keep within the bounds of most rigid scientific truth; to say, "Not only does suppuration never occur without these figured elements, but no definable form of suppuration ever occurs without its definite figured element." No pathologist skilled in modern culture will for an instant dispute this statement, and those who do are led to do so by ignorance.

Among the forms of suppuration caused by known and named figured elements is the very disease in question, for which the most apt word "cementitis" or "pericementitis" has been coined.

Had I no further object in view than to simply state the case, my purpose would be subserved by saying, "while clinically I know next to nothing about the separation of these three forms of disease, and my knowledge in this clinical bearing is wholly at second hand, for I am no clinician, that which I do know as a pathologist from the study of specimens sent to me for examination, accompanied with memoranda of clinical details for my further enlightenment, enables me to say most positively that the three congeries of symptoms, which I have referred to, do actually exist well and sharply defined, and also a fourth one, but this is less clearly marked. As to the clinical distinction answering to the pathological one, there is not the smallest doubt whatever." Logically, there should be two other forms in addition to these three, as will appear later, and undoubtedly they exist; but it may be that by reason of their extreme infrequency, or because the study made is insufficient, they remain in the

undefined haze which surrounds the whole question clinically, as yet but indistinctly seen.

It is utterly useless to discuss the question, "Is suppuration in general caused by the figured elements known as the suppuration schistocytes?" because those who decline to believe it are only those who are wilfully ignorant. The present question, the question seeking elucidation to-day, is this: "From which side of the plane of disease, speaking pathologically, does the diseased action come?" Many writers and teachers seem to think "from the circulation side." Let us examine the reasons for accepting or rejecting this hypothesis.

Relation of the Blood to Suppuration.—If it be true, it requires that the suppuration's cocci be circulated in the blood before the manifestation of the diseased action, and that the provision existing for the capture and destruction of such intruders in this case should be either non-existent or a failure. The objections to this theory are insurmountable. In the first place, we know what the congeries of symptoms are when the suppuration's cocci make their way and growth in the blood against the efforts of the phagocytes, the body's standing army always on the alert against invaders. Such congeries of symptoms are those which we call pyemia, suppurative disease of the liver, which is always accompanied by other and corresponding lesions in other parts of the body, diffuse tuberculosis, the dreaded variola and the like. Even the disease which we have now learned to call "furunculosis," and which sometimes so curiously mimics smallpox both in symptoms and results that men have mistaken the diagnosis, is not a blood disease with a local expression, but an invasion from outside; and although it is sometimes followed by terrible secondary consequences, these are distinctly septic, distinctly the results of chemical poisons elaborated on the surface of the body and there absorbed. No argument is needed to show the difference between these diseases, between pyemia and the disorder under discussion, either as to their anatomical seriousness and the influence which they exert, by the permanent lesions left behind after convalescence, on the afterlife of the unfortunate victim.

It will be urged that certain men are teaching that various cocci and bacilli can at any time be found in the blood by cultivation experiments, and also all that is needful to establish a "focus" is a "weak spot," a "something in which these figured elements may have found a nidus for the reproduction of their kind;" given this nidus,

say these teachers, and the deed is done, suppuration begins at once. This teaching was the current orthodox belief fifteen or twenty years ago, and some men may still believe it, but for the student fraction this theory has been dead and buried for years; indeed, it was refuted almost before it got outside the laboratory in which it was formulated; it proved too much; it was utterly untenable; it was logically impossible. In almost any specimen of blood obtained by pricking the skin phagocytes can be found with cocci and bacilli within them, but the cocci are not ruffians at large; they are but arrested peace disturbers in the police band wagon, to be unceremoniously dumped out on the surface of the intestinal tract if they live long enough, to be thrown on the body's dust heap if they die.

Abscesses on Living Teeth.—I have before me a monograph by one of Zeigler's pupils, in which this very form of suppuration, that at the base of a tooth apparently sound, is used as an illustration, and in a way as an argument to show that the cocci of suppuration must come from the circulation's side. But his argument fails, being based on fallacy. In effect he says: 'Since we cannot show that these bacilli come from the ectoderm, and they certainly came not from the endoderm, we must admit that they came from the mesoderm, that is, from the blood vessels.' This is wrong in logic to begin with. It is based on an assumed ultimate knowledge, one might almost say that he predicated it, which knowledge as a matter of course he did not and could not have; and its assumption that the structures surrounding such a tooth are really sound, that they are really existing in ideally perfect conditions because he cannot prove the opposite, is absurd.

Many men who write are altogether too prone to use the word "physiological," especially when coupled with the word "condition," as though it were an expression of an actual instead of an ideal state. Were conditions ideal, disease would long ago have been a tradition simply. In fact, physiological means only that the conditions are not incompatible with usefulness. Granted that the tooth does seem perfectly normal, who is there who shall change the words "does seem" to "is;" who can know enough of any tooth to say "it is perfectly normal?" Or while, as now, the word "normal" means only agreeing with the usual appearances and observations, to change this word to "ideal," or to use this word "normal" as equivalent

therefor? A tooth which in every way agrees perfectly with the usual appearances, and has even been asserted to be perfectly normal, has once and again deceived the most skilled specialists as to its real condition, both as to the matter and the manner of disease, as all men know too well. I think that we may safely use greater modesty of diction, as well as greater accuracy in our choice of words, both in the thought and its statement in discussing both physiological and pathological processes.

To bring the matter to its final expression, it is my contention that not one little sparklet of scientific evidence, evidence so guarded against error that it cannot be gainsaid, has ever been brought forward to show that abscesses in the neighborhood of the teeth are caused by suppuration-schistophytes circulating in the blood, and that all analogy and experience are both alike against it. If men, so many men, have died and worms have eaten them, but not for love, just how many teeth have died and their entire axial structures been softened and destroyed, and even had amorphous centers built up by repair processes without one suggestion of suppuration, although in some few cases evidences of inflammatory disease have been found on examination post-mortem? The clinician with his experience may say "not any," but the pathologist with his specimens will say "legions."

Were the suppuration cocci roaming the blood in search of places in which to fix their homes, this could not be, or our bodies would be simply bodies of corruption. But as I have said, they are not so roaming; the very few which escape the policemen on guard are caught immediately by the huge multitude of the phagocytic cells and never get a chance to reach a place in which they might make trouble. Entering the body by way of the skin, lungs, intestines by myriads every day, how many are there living long enough to carry out their evil will? Yet far too often for our comfort trouble comes; if not by way of the blood, then some other way, but how? Is the explanation not in order? Most certainly it is. The pathology of the suppuration process in relation to the teeth, for such in fact is the question really demanding attention, is one so beclouded that it is difficult to begin in just the right place, but the first thing to be remembered is that teeth are in fact dermal appendages paralogous of the nails and hair, and in seeking for the pathological analogies we must look to the nails and hair rather than to other structures, and

in the inflammatory disorders of the hair follicles we really find the nearest analogies to the peridental suppuration.

It is useless to discuss the cause of suppuration. Every one now knows what it is, but it may be worth while to mention that in the life history of every coccus form there are many periods, during two of which it is distinctly motile. One when previous to encystment the cell contents are making a journey as an ameba, the other when, freed from the enclosing cyst, the young plants are free swimming "spore-like bodies." The life history of these microphytes is not nearly so well known as it should be by all who have to deal in thought or act with them and their results in daily life. With this as the reason for so doing, let me go over the life history and life work of these organisms.

Life History of Microorganisms.—Most men who see these bacilli do so in strained specimens mounted in balsam, as it were a part of a cabinet of curios, and it would seem from pictures and written descriptions that even those who professionally claim an intimate acquaintance really know them only in one stage of their life history as exhibited in one culture medium and one only. The examination of these beautiful slides with an oil immersion is a very pleasant way to pass an idle hour, but as an attempt at serious study it is much belated. If the balsam mount is carefully stained by Gram's method, and most probably it is, all that the eye can detect even with the best objectives will be something less of depth of color in one coccus than in another, but if the staining is not too deep and is otherwise unusually successful, it will be seen that the cocci are not all alike and that some have no cell contents. If, however, the cocci are grown on the cover glass in gelatin faintly tinted with "life blue," we see that the cells which were found empty in the balsam-mounted slide were the empty membranes of cells which had been evacuated, and it is quite likely that even while we are looking at and examining the slide, another one will break and with some speed evacuate its cell contents, and if the magnification is sufficient and the lenses equal to the best, it will be seen that the cell contents thus evacuated are an ameba containing granules, and these granules stain bright blue. [This word ameba is used to express a body form, not any definite animal. The use implying a generic or specific meaning, however permissible a century since, is not so now.]

This culture has been made in artificial saliva, as well as in other

culture fluids, and here also this process of the evacuation of the cell contents and its independent ameboid life are well seen, and it will be noted that the activity of the ameba is relatively great, and at length one comes to understand that so small and so active beings must be able to reach to many unexpected places, and to some which would hardly be thought of as accessible to them. After a greater or less period of ameboid existence the ameba is encysted, obtains a shell more or less protective, and after a time discharges a number, at least more than twenty-five, and it may be more than one hundred granules, which at first are also motile. These in their turn develop into spheroidal cocci, grow into chains and renew the cycle. Such being the life history, it is no particular wonder that this coccus group, for apparently all the suppuration cocci alike fulfill this cycle, is found in many *bizarre* and unlooked-for situations. In situations which at first seem unaccountable, but which after reflection and a second thought are quite deprived of their element of impossibility and unexpectedness; they cease even to seem new. This life history probably belongs in general to all the figured elements, called "micrococci," really diminutive algæ without leaf green, found in a causative relation to the inflammation processes, of which we certainly now know and recognize three species and no more.

Micrococci of Suppuration.—These three species which have been found in causative relation to the suppurative processes at the roots of the teeth are as follow: 1. A coccus whose cultures are white, as is also the pus. 2. A coccus whose cultures are almost orange, while the pus is distinctly yellow. 3. A coccus whose cultures are cobalt blue, while the pus is a faint blue. 4. A combination of 1 and 2. Clinical picture not identified. 5. A combination of 1 and 3. Clinical picture is not identified. 6. A combination of 2 and 3. Clinical data conflicting, almost contradictory.

The details of these clinical pictures are not given here, as they are not in the premises germane. It is sufficient to say that the one producing the most trouble is 2, than which 1 is found more frequently in those cases where the suppurative process is either just below the border or line of contact between gums and teeth, while 2 is more often found in deep abscesses, such as those which discharge through the pulp canal. The one given as 3 seems to be implicated in the most trying of all suppuration cases. One of my correspondents who has sent me pus from a number of abscesses,

which he sees fit to call blue-green abscesses, says of it in his last letter: "I am coming to look upon this pus as a sort of hoodoo. Since you warned me about it I find it more frequently than I did, and I find such abscesses particularly hard to cure. They have a way of refusing to heal, a sort of recrudescence habit, which is trying to my nerves." He has found the white and yellow pus in the pulp cavities of normal teeth (sic!), but he has never found the pus of a greenish hue unless the teeth had obviously decayed. Another correspondent says: "I have seen pus with a green to greenish hue many times, but never so distinctly green as this, in which the tooth was seemingly quite normal." (Sic!) It must not be forgotten that every one of these figured elements can be found in mouths which the most careful examination affirms to be healthy, found not enclosed in phagocytes, but in full functional activity, ready to take any advantage or opportunity offered to them for getting in their work, for entering on their seeming predestined vocation and exciting suppuration.

Invasion of Micrococci Into the Tissues.—It remains to show how this is done. In forensic logic a case is considered as proved if it is shown that John Doe had the intention of burglary, if he is found in a house where he had no business to be, with the silver spoons in his pocket. Presumably the same logical conclusion may be drawn in this case, but it must be shown that the cocci had an opportunity for reaching the base of the tooth from the oral as opposed to the vascular side. It has been explained that at two periods of their lives these cocci are motile, the ameba is less in bulk than the coccus, say one five-hundredth the bulk of a colorless blood body, and it would take more than one hundred of the sporule bodies to make one ameba, hence the inference that they are very small indeed as compared with a blood corpuscle.

The line of contact between the gum and the teeth is not so close as to hinder such a crawling thing as an ameba is from making its way, nor would such a creeper have any difficulty in getting about among the tissue elements when such a giant as a white blood body can go about with comparative ease. Cross sections of the tissues in the neighborhood of the site in which suppuration occurs show that the tissue is less dense than many through which lymph corpuscles go without difficulty, and the lymph corpuscles are often found in the pericementum. That such cocci do in point of fact make their

way into this structure is an observed fact, for I have seen a slide in which was distinctly visible a phagocyte containing eight of these cocci which it had seemingly just gathered in and had now in safe custody, and in this specimen between the gum and tooth was a depot of cocci just beginning to set up an inflammation. This tissue is peculiarly well fitted for such an invasion from the mouth. Ameboid bodies of such small size can readily find their way even to the very opening of the pulp canal at the very root of the tooth, by keeping to the connective tissue bundle layer just outside the line of cells adjacent and in contact with the distinctly cellular layer in contact with the teeth. So compact is this connective tissue that white blood bodies move about in it with difficulty, but the ameboid cocci find it an easy way.

Granted then that the ameba form coccus has a convenient locus for its work, what happens? First of all the coccus encysts itself and becomes quite inert, motionless, quiescent; the disturbance it has made, if it has made any, which is doubtful, decreases to the vanishing point. How long it can remain latent and concealed we do not know, but long enough for its needs no doubt. Then comes the second motor stage, and as there is no opportunity for its exercise, it is of course, abridged and the spores begin to develop all in a bunch. Then there is a first-class disturbance, and cell proliferation goes on rapidly. It is a wrong kind of growth for the needs of the tissues, but it is the only one the cells around are equal to; stimulated they grow; the development is short lived, for the very growth cuts off the blood supply by mutual pressure. No better opportunity than this for the cocci can be imagined, surrounded by cells of lowered vitality, some dead, some dying, they feed to absolute repletion and increase accordingly, extending the depot in all directions, so rapidly indeed that by the time the tissues can take on any systematic defense the trouble has grown too great for cure by any means short of actual suppuration. A line of demarcation is made in the tissue, the scavenger cells enter the focus, and the formation of pus begins. While certain cells prepare a road for exit of the army which has made captive the invaders, the nerves of course are suffering, as are the other tissues, the increasing pressure causes pain, and a painful swelling results. When the road has been opened, the scavenger army and their captives—that is, the pus and broken down tissues—

are evacuated, repair processes begin, and soon the hole is filled by the cicatrix.

Such is the process of invasion and defense as shown by observation and study. The blood has no connection with the process save only incidentally in the fulfilment of the task laid upon it, the defense of the tissues. It is then a matter of observation that the invasion is from the oral side of the plane of contact, not from the vascular side. The blood conditions antecedent to suppuration are those which belong to health, to vital action. The blood's condition before the suppuration was *ad hoc* healthy; during the diseased action in the tissues the blood's action was for and toward the restoration of normal conditions.

To maintain that the condition of the blood is the cause of suppuration is equivalent to saying that the court which tries a man for stealing made him a thief. To repeat and insist as some men are doing that the peridental phlegmon is a manifestation of a dyscrasia, is equivalent to saying "The lessons which have been learned during the last thirty years by that portion of the profession which sees, studies, thinks, are lost on me; are lessons which I will not learn, as by not learning them I become notorious among my fellows, even if such notoriety is an omen of injury to my patients."—*Items, August.*

SUBMENTAL SINUS, A SEQUELA OF INFLUENZA, TREATED BY ROOT FILLING. By W. J. May, L.R.C.P., London. The case I wish to bring under your notice is that of a young lady, aged about 22. In December, 1899, she had a severe attack of influenza. She apparently completely recovered, but about six weeks later noticed a swelling under the lower lip in the region of the incisive fossa. An abscess formed and pointed under the chin. This was opened in February, 1900. The teeth were not suspected as a cause of the trouble. In April, 1900, a sinus still persisted, and the patient was admitted into a hospital in order that an operation should be performed, and she remained in hospital for a week.

The operation consisted, presumably, in examining the sinus and endeavoring to remove necrosed bone. In spite of this treatment the sinus did not close. In February, 1901, the patient came under the notice of a Dublin surgeon. He at once thought that the teeth, although apparently sound, were the cause of the abscess, and took the patient to a dentist of Dublin. This gentleman, seeing that the two

lower incisors were dead, had a skiagram taken in order to ascertain the length of the roots and to see whether any absorption had taken place during the prolonged suppuration. Finding that the roots were of normal length he decided that the teeth might be saved. He opened the pulp chamber and dressed the roots. As the patient was coming to London he sent her to me for further treatment. When I first saw the patient on April 3, 1901, she was considerably disfigured by a mass of granulation tissue beneath the chin, and also by inflammatory swelling of the integuments, due to pus becoming pent up within the sinus.

The treatment adopted was simply to cleanse the root canals in the usual manner and fill them with gutta-percha. The sinus was opened up and packed with iodoform gauze. I was able to pass a bristle through the apex of the left central incisor, but not through that of the right incisor. I always endeavor to pass a bristle in this manner when a sinus exists in connection with a root; as, however, from the skiagram I was certain of having penetrated to very near the end of the root, I did not persist in the attempt to get through. In three weeks the sinus had distinctly shortened, and in another fortnight it had become completely closed.

In the skiagram taken after the roots had been filled and the sinus had become closed it is noticed that the root-fillings present are not perfect, but I believe the result is as good as we generally achieve. You will see, also, that the cutting edges of the teeth are separated; this I attribute to contraction having taken place upon the formation of fibrous tissue at the apices of the teeth, the alveolus between the teeth acting as a fulcrum, having led to a separation at the cutting edges. I recently heard from this patient that she had had no further trouble.

A short time ago Mr. F. C. Wallace communicated to the Odontological Society the record of a case in which a misplaced third molar gave rise, during an attack of influenza, to symptoms simulating necrosis of the mandible. In this case an operation was undertaken with the view that necrosis existed. He raised the question as to whether the inflammation in these cases commences in the pulp and spreads to the periodontal membrane and bone, or whether the inflammation has origin in the tissues surrounding the tooth. He inclined to the former view, while Mr. Baldwin favored the latter opinion. I think in this connection our experience teaches

us that when a previously healthy tooth pulp becomes inflamed and dies, either from a general cause, as influenza, or from a local one, as, for example, too large a metal filling, periodontitis does not often supervene at once. It may be that the periodontal membrane will not become inflamed for six weeks after the death of the tooth-pulp, as in the case I have mentioned; it may not do so for six months, as in a similar case I have notes of; or the tooth may remain quiescent for years, becoming gradually discolored.

On the other hand, we know that when the vital resistance of a patient is lowered by even a slight cause, such as a common cold, and much more by a serious illness, periodontitis is very prone to occur in connection with such weak spots as unfilled or imperfectly filled dead teeth, and sometimes even with living ones. I am therefore inclined to think that inflammation and suppuration arising during an illness in connection with a tooth, either normally situated or misplaced, commences not in the dental pulp, but in the tissues around the tooth—namely, in the periodontal membrane if the tooth be normally situated; and either in the periosteum, or the dental follicle, or the bone, if the tooth be unerupted.

Discussion.—The president thought that Mr. May had raised a very important pathological question by the way in which he accounted for the condition of the patient, and had advanced a novel theory for the separation which so often took place in the lower incisors. It would be interesting to know whether the author attributed the separation of apparently healthy lower incisors to the contraction of tissue at their roots and the fulcrum of the bone between. It was an everyday occurrence in practice to see perfectly healthy teeth moving from one another. Mr. May's explanation seemed a very good solution in the case of dead teeth, but he did not quite see how it applied to perfectly healthy teeth.

Mr. T. A. Coysh said he had had a case identical with that of Mr. May in a girl of 16, with the exception that one incisor only was dead. Practically there had been no uncomfortable symptoms at all. When he saw her there was a slight swelling from the sinus below the chin, to which the patient and the dentist she had formerly seen had apparently not paid much attention. Obviously one of the lower incisors was dead, and it was drilled into, the root treated and filled, and the sinus then healed up without any trouble. In that case the incisor died from a blow. He saw the patient four

or five years after the root was filled; there was then no separation of the incisors, everything being perfectly normal.

Mr. E. Lloyd-Williams said that at the Dental Hospital that very day they had had a patient, a man of 26, with a sinus which had existed for twelve years, with apparently no lesion of the teeth. On carefully examining the teeth, one was found to have lost its translucency, and was supposed to be dead. It was drilled into and the conclusion found to be accurate. It had been treated exactly on the lines suggested by Mr. May. He was glad to have heard of the case, because it promised well for the other one, which had existed for such a long time. The pathological question was an interesting one, a discussion of which might take up a whole evening. He was inclined to disagree with the author on the point, thinking that the inflammation started in the pulp itself. He also argued from analogy. The analogous cases that were common were those of pyorrhea, where it was known that a suppurative periodontitis had existed for a long time. It was well known that in these cases the pulp retained its vitality for a considerable period after the suppuration of the socket had taken place. He therefore thought it was more likely that the inflammation started in the pulp in the same way as an inflammation in any other part of the body. The point with regard to the separation was also interesting. He believed it was due to pathological changes in the bone itself rather than to granulation tissue, because there was no granulation tissue in cases where there were healthy teeth, and yet they were always seeing them separated. He saw no reason why the bone should not undergo pathological change resulting in interstitial growth which tended to separate any teeth existing in the immediate neighborhood.

Mr. W. Hern thought the case illustrated the importance of examining the teeth to see whether they were living or dead in all cases of sinuses of obscure origin opening into the mouth or on to the face. He had come across cases on more than one occasion in which hospital patients been had sent up from the country to a general hospital with which he was connected to have some surgical intervention for the cure of sinuses about the jaws. Such cases had usually been sent on to the dental department before any operative procedure was undertaken, in order to eliminate any causes from the teeth, and it frequently happened that such cases had been

sent home cured without any more serious operation than the extraction of a dead tooth or buried root. With regard to the pathological question, he agreed with Mr. Williams that in these cases they were due to septic apical inflammation, set up by some of the septic contents of the pulp cavity being extruded from the point of the root. No doubt any depression of the general health, even a cold, would start an inflammation in a dead tooth with septic contents, but he considered that only a secondary cause, the primary cause being the presence of septic material in the tooth. He thought Mr. May's allusion to a remark made by Mr. Baldwin did not apply to the present case, as Mr. Baldwin was speaking of buried living teeth, or teeth in which inflammation commenced around the crown and not around the root. He thought the history of odontomes showed that buried teeth which were normal, or odontomes, usually remain quiescent as long as the soft tissues overlying them were unopened, and that the inflammation starts coincidentally with this communicating opening into the mouth by infection of the tooth sac with mouth organisms. He asked if patient had pyorrhea, which would explain the separation of teeth.

Mr. Baldwin said that when he spoke at the Odontological Society recently he referred only to buried teeth which developed an abscess around them. He thought in the majority of those cases the teeth were not dead and the suppuration commenced around the crowns of the teeth. Whenever the teeth were dead, as in Mr. May's case, he thought the most likely explanation of the inflammation was that it was septic inflammation set up by the escape of septic material from the pulp canal into the soft tissue. When teeth were killed by a blow, as probably front teeth generally were, the pulp became absolutely diffuent and decomposed in some way, and might or might not set up abscess. They much more frequently did so when it was a lower incisor, probably because the force of gravity helped the escape of septic material, and that result would naturally be assisted by any disease, such as influenza, which would lower the general tone and increase the number of microorganisms circulating in the blood.

Mr. Ashley Densham recorded a case which had come under his own notice, in which there was submental inflammation followed by a sinus in a child of 6. The surgeons who treated the case removed, through an opening made by enlarging the sinus, two im-

perfectly developed permanent lower incisors. The temporary incisors had become absorbed, and had recently fallen out. There did not appear to be any communication at all between the oral cavity and the crowns of the forming permanent incisors. In that case there was a very considerable amount of inflammation, evidently septic, and there was a very large swelling underneath the chin, which eventually discharged through a sinus. He quite agreed that the inflammation in most cases of buried teeth came from some communication with the mouth.

Mr. Clark asked if it was quite clear that the teeth were alive before the attack of influenza took place.

Mr. Farmer referred to a case where there was a small abscess at the apices of two lower incisors, with a great deal of swelling, but no submental sinus. The patient, a flutist, complained of tenderness when he placed the flute to his lips. At the apex of the right lower central and right lower lateral incisor were two small abscesses. The electric light showed that the pulps were alive, and that there was no dental cause of the trouble. Mr. Bland-Sutton saw the case, but seemed dubious as to the cause. After the pus was evacuated some spicules of dead bone came away and the parts healed up. Since this happened, three years ago, the patient had had no recurrence. There was no apparent lesion either in the teeth or mucous membrane, and no signs of the pus burrowing. Could any member account for the presence of pus under these conditions?

Mr. May said he had not the faintest idea why teeth moved in the extraordinary manner they sometimes did. He only stated that in his particular case, where the apices of the teeth were embedded in fibrous tissue, that accounted for the separation of the teeth. At any rate, they did not begin to separate at the cutting edges until the fibrous tissue was formed and contracted. A gentleman had asked him how he knew that the teeth died through influenza, and whether they were alive before. He did not definitely know that, but he argued it was so from the analogy of other cases. The teeth were only beginning to discolor, and if they had been dead for five or six years he should have expected to find them more discolored. He believed Mr. Hern and Mr. Lloyd-Williams agreed with him, although he would have a difficulty in showing why. They said that the inflammation commenced in the pulp. He

argued that in cases where previously healthy teeth died from influenza or other cause, periostitis and suppuration did not supervene in the majority of cases for some weeks or months, and then commenced in the tissues around the tooth, as a dead pulp obviously could not become inflamed. Supposing the patient had an attack of influenza, with swelling and necrosis arising during the attack, he would say that the teeth had been dead or unhealthy for some time previously, and that the lowered vitality of the patient had set up the inflammation and suppuration again in the tissues around the tooth.—*Jour. Brit. Dent. Assn.*

PECULIAR CASES OF DENTAL RESORPTION. By Otto E. Inglis, D.D.S., Philadelphia. Read before the Academy of Stomatology, November 26, 1901. It is a generally accepted fact that resorption of tissue is effected through the agency of cells belonging to the connective-tissue group and commonly called "giant-cells." These are large cells, either mononuclear or multinucleated, found to be capable of excreting a substance which liquefies or detaches small particles of even solid tissues, such as bone or even enamel. The resulting chemical product or particle is either washed away by the lymph-stream or taken into the body of the giant-cell and borne away.

These multinucleated cells are found in granulation-tissue, which in turn is in some form almost invariably found in apposition with surfaces or tissues undergoing resorption. It has been suggested that the solvent excreted is lactic acid, though there seems to be no demonstration of this fact. Theoretically, acid sodium phosphate would seem more likely to be the solvent, as surfaces undergoing resorption are eroded, not decalcified. The writer has endeavored in vain to get an acid reaction with litmus paper touched to the granulations, though numerous efforts have been made. It is quite possible, however, that any acid present may be masked by the general alkaline reaction of the blood plasma, while the giant-cell itself, excreting such an acid against a tissue, may accomplish its physiological object.

Resorption of deciduous roots occurs as a physiological process, while resorption of permanent roots is classed as pathological. There are also records of a few cases of resorption of the crown dentin of permanent teeth, presumably through the agency of giant-cells in

the dental pulp. In all cases it seems possible to refer the resorption to irritation with the production of a mild grade of non-purulent inflammation as a cause. There seems evidence enough to warrant this assumption. Pus formation retards or prevents resorption presumably through neutralization of the acid product of the giant-cells, the reaction of pus being alkaline. When pus formation is in abeyance granulations spring up.

In Gaskill's case of dentin resorption by the pulp the vascular alteration in the pulp was shown by the pink color transmitted through the enamel, this being evidence of a condition of advanced hyperemia or of mild inflammation.

Resorption of cementum and dentin occurs in resorption of deciduous roots, and is produced by the resorbent organ exterior to the tooth. In a certain number of specimens of loose deciduous crowns there may be found after extraction bays of resorption in the dentin of the crown. In a case of extreme excavation the entire dentin of the crown was removed by the resorbent organ, the enamel alone remaining. In a third case the dentin was largely removed and the tooth perforated upon the mesial side from within by the resorbent organ. A diagnosis of suffusion from hyperemia had been made, but upon rapid extraction the pulp was found as a large soft mass, but in a vital state within the crown; that is, the erstwhile pulp had become a resorbent organ. All appearance of suffusion disappeared with its removal from the crown concavity, and the tiny mesial opening was discovered. There were no signs of caries whatsoever. This case practically corresponds to that of Gaskill's, but adds the important fact that enamel might readily be resorbed by granulation-tissue from within. That in Gaskill's case is described as crushed in.

In a left lower deciduous lateral incisor, standing labially to the permanent left lower lateral incisor, extraction revealed a hyperemic condition of the pulp for a length of one-quarter of an inch from the apical end of the root, which was but slightly resorbed. The root end was transparent and the hyperemia visible as a clearly defined pink streak.

While the pulp may become involved in the resorbent organ and become a part of it, it does not of necessity follow that it does so under all circumstances, as some specimens show a condition the reverse of that previously mentioned. Tomes maintains that resorp-

tion of deciduous roots is a vital act not dependent upon the pressure of the advancing permanent tooth. If one observes, however, the numerous examples of resorption occurring at the pressure point, it will seem hard to accept the theory, even when resorption does occur without a tooth near by to cause pressure. Deciduous cuspids are notoriously retained late when the permanent cuspid erupts late, or anteriorly or posteriorly to the deciduous tooth. It is true that these deciduous cuspids are often later lost by resorption, but in all probability they have been somewhat affected by resorptive action during the descent of the cuspid. In a mouth recently seen eight deciduous molars were in place at about twenty-one years of age. There was no mechanical impediment to their shedding.

In the resorption of the roots of the permanent teeth aseptic irritation seems to be the proximate cause for all devitalized teeth, and where the pulp is vital it is not always possible to say that irritation is not still the cause. For example, some such teeth are in malocclusion, some in pyorrheal conditions, and in others marginal gum resorption or pulp irritation is going on. The existence of a dyscrasia is also recognized. A patient of mine lost a right lower molar by resorption after arsenic was applied to the pulp. I naturally connected the resulting pericementitis with a possible passage of arsenic through the foramen, and made a record of the case. Since then I have extracted two resorbed supernumerary molars, and have discovered that the lingual root of an upper molar is partly resorbed. The tooth is still in the mouth, but the lingual root has lost the alveolar process upon its lingual aspect by phagedenic pericementitis and resorption, a fact which enabled me to discover the loss of its apical third. The patient is a neurasthenic.

Among the specific recognized causes of resorption in permanent teeth are the following: Chronic abscess (temporarily in abeyance), plantations, protruding root-filling or broaches, looseness, and pressure. A certain number of cases are due to blows and malocclusion, a few to calculus and pyorrhea alveolaris. I have a specimen which shows a curious combination of resorption and calculus formation from a case of prolonged chronic abscess. The resorption doubtless was due to the formation of granulation tissue during such time as pus formation was absent or not active; or possibly the inflammation of the pericementum at a point contiguous to the area of pus formation might account for the resorption.

The frequent occurrence of resorption in connection with chronic abscess of long duration inclines me to believe that the former is the true explanation, especially as I have seen granulation *in situ* after extraction. It is, of course, possible that the pyogenic germs may eventually be shown to have some erosive action. At present such a view cannot be accepted without a demonstration; indeed, Green states that an ivory peg may lie in pus for weeks without visible effect, while it undergoes resorption if aseptically buried in the tissues.

A transient patient from the practice of Professor Eames of Boston presented an unusual resorption upon the lingual surfaces of four lower incisors, calculus being the exciting cause. The pulps were not exposed.

Resorptions after plantations are explained upon like grounds of formation of granulation-tissue, bony ankylosis being later brought about by a better tolerance and a constructive activity of bone-cells. The peculiar generally distributed resorption in cases of exfoliation after plantation is evidence of a general pericementitis. Curious resorptions of roots from about gutta-percha root-fillings, cotton root-fillings and protruding broaches are common.

A root may be perforated from the side to the canal, or even from side to side, by resorptive action. I have a specimen which shows a remarkable case of resorption of permanent roots simulating resorption of deciduous roots and due to the same cause, viz., pressure of an advancing tooth. The history was that of indefinable neuralgic pain about the upper third molar, necessitating extraction. When removed, the buccal roots being absent, it was thought that a fracture had occurred. An attempt at their removal resulted in the dislodgement of a fourth or supernumerary molar, the crown of which exactly fitted the area of resorption at the cervical third of the buccal roots. Other cases of resorption of permanent roots by advancing crowns of impacted teeth have been discovered by means of the Röntgen ray, and after extraction for relief of pain.

In some cases of impacted teeth even the enamel may suffer marked resorption, as in the case of a cuspid taken from the jaw of a lady sixty-five years of age. The tooth slowly erupting was upon one side of the gum and a gold plate upon the other. The resultant tumefaction was natural. Ulceration occurred; the crown came into relation with the oral fluids; granulations formed upon the under

surface of the tumefaction, with the result that resorption, but no caries, supervened, or, indeed, may have occurred previously, as it was present and obvious to instrumental diagnosis for months before extraction. Miller recently, and Cryer previously, have noted the condition of enamel resorption. Another specimen in the writer's possession shows a circumscribed bay-like resorption of enamel and dentin. The term resorption having been objected to as not applicable to enamel, it may be said in defense, that it seems better than the term "absorption," for though not deposited by mesodermic tissue, enamel is removed in the same manner as tissues of mesoblastic origin, and to be exigent would be to necessitate the abandonment of the word in connection with nerve-tissue as well.—*International*.

PYORRHEA ALVEOLARIS. By F. E. Howard, M.D.S., Buffalo. Read before the Eighth District Dental Society of the State of New York, February 25, 1902. By one prominent in dentistry it has been said, "It is the reproach of dentistry that the disease which causes the most trouble is the least understood." This subject will be a rich field for investigation for a long time to come. Although it has been touched upon by writers since 1740 (P. Fauchard) to the present, much is yet to be learned. Dr. John T. Riggs was among the first to give this condition special clinical attention, some twenty-five years ago, and for some time it was termed "Riggs' disease." A great diversity of opinion exists both as to the origin and the treatment of this affection. It is fair to presume that the cause is sometimes local and sometimes constitutional, and at other times both. The disease has not developed with civilization, but dates back to the cave-dwellers in this country, and "In the museum at Constantinople are the skulls of soldiers who fought at a battle in 328 B. C. One of the skulls has the anterior alveolar process entirely absorbed away; the roots of the right central, the right lateral and the left central incisors are exposed." I mention these cases only to remind you that this disease is nothing that has manifested itself latterly.

Dr. Peirce charges the disorder chiefly to systemic predisposition, and enthusiastically advocates the theory of Reese, as to the influence of the uric acid diathesis. Dr. W. X. Sudduth strongly argues for the lactic acid influence as a local factor in the disorder. He also

speaks of this as a localized catarrhal stomatitis, which may be either acute or chronic. Dr. Miller has expressed his opinion that the disorder is of a parasitic nature. Dr. Talbot regards the disorder as local, due to both local and constitutional causes. The disorder begins with simple inflammation. He terms it "interstitial gingivitis." Dr. J. D. Patterson believes that the disorder is of catarrhal origin, and states that out of thirty-eight cases of well-marked pyorrhea observed by him thirty-three presented undoubted evidence of nasal catarrhal conditions. Dr. S. N. Niles considered that constitutional conditions were, as a rule, without influence, and local irritating deposits to be the cause in twenty-five per cent of the cases coming under his observation. He was of the opinion also that the amount of calcium salts taken into the system in drinking-water exerted an influence. A calcic and phosphatic diathesis has an influence in the production of the disorder. Dr. Bonwill believed that the disorder is due to thinness of the alveolar process between the teeth, such condition depriving the peridental membrane and gum tissue of proper support. The want of proper articulation of the teeth also exerts an influence. This theory is supported by others. Dr. C. J. Essig was of the opinion that its predisposing causes were unknown, that it occurred as a rule in healthy persons, and that irregular and crowded teeth acted as an exciting cause. Dr. G. A. Mills thinks that the disorder is of systemic origin. Various mental and physical influences aid its progress, such as nervous exhaustion and bodily and mental overwork. He notes that it frequently occurs with children and in convalescence from eruptive fevers, and considers that the deposit is only a local manifestation of the disorder. The exciting causes may be purely local, or may be local expressions of constitutional influences and states. "Thus it will be shown that the influence of the uric acid, when present, is exerted as a local irritant and not a constitutional factor. . . . The theory urged so strongly by Dr. Peirce, also advocated by Dr. Kirk, is the uric acid hypothesis, once very dominant in medicine, but now losing ground. The trend of medical opinion is to consider it one of the danger signals of autointoxication, which assumes prominence because of its tendency to excite local irritation." With a number of experiments conducted in different colleges in the interest of this subject upon some 900 teeth it was plainly shown that uric acid was only a factor in these cases, averaging only five per cent. Dr. G. L. Curtis says

that real pyorrhea alveolaris is always caused by syphilis. This disease is not confined to man alone, but affects dogs, cats and other animals, as shown conclusively by Talbot's experiment.

To sum up: My observations lead me to believe that pyorrhea alveolaris is largely local—perhaps in some cases aggravated by constitutional causes. The local causes are lack of cleanliness, neglect or inability to keep the parts clean; deposits occur, and inflammation ensues, and from a single point the trouble extends. In my judgment one of the causes to promote this disease is the fact that at the time of life when this phenomenon is presented these teeth usually possess a low degree of vitality, and in many cases they are not in harmony with their surroundings, the more vascular tissue, and these organs act as local irritants. They are repelled by nature on the part of the higher organized and more sensitive tissues.

It has been shown conclusively that the administration of certain drugs will promote pyorrhea alveolaris. Calomel, plumbic or brass poisoning, arsenic, iodid potassium, and tartar emetic, under some circumstances will irritate the weak membrane. I find in a large percentage of cases that the patients are afflicted with catarrh—many are of a catarrhal diathesis. I have observed that these subjects are not particularly prone to gout or rheumatism, neither do many appreciate that they have an excess of uric acid. On the other hand, I recall to mind many people that have been great sufferers from rheumatism and gout that have no tendency to pyorrhea alveolaris whatever, and they are well advanced in years. Many of these subjects are of a very robust and healthy class, never realizing that anything is wrong with them.

The dentist must see the patient often enough to keep the teeth free from deposits and keep down the inflammation. If this be accomplished the disease will be under control. The deposits must be removed from all surfaces, otherwise no amount of medicating will avail anything. If this be accomplished, and the alveolar process be not too much absorbed, and the teeth not in a very loose condition, a cure will be effected. There is sometimes great advantage derived by devitalizing the pulp. Nature's effort to supply the pulp is relieved by devitalization, and greater energy is thrown into the cementum, and at the time of life when pyorrhea is present there is little call for pulps in the teeth that are marked by this trouble.—*Cosmos*.

"PAINLESS DENTISTRY." Notwithstanding the adverse experience of the many victims of company and parlor fakirs, "painless dentistry" is a catchword which, at much cost of printer's ink and signboard lettering, it still pays the quack to juggle with. The staying quality of this fetching phrase, while doubtless based chiefly upon the gullibility of a public too ready to yield credence to any mendacity so it be sonorously reiterant, has also another significance, the existence of a desire for exemption from suffering so deep-seated and universal that it is ready to grasp at the most unhopeful agencies for its realization.

As a sensory manifestation pain is, of course, subjective and to a great extent relative, varying directly with the susceptibility of the organism. With the human family the degree of this susceptibility is dependent upon a complex of conditions too obscure and varying for analysis or classification. As a rule, however, the higher the intellectual development and the more exhaustive the drain upon the higher centers of nervous energy the greater the impressibility of the sensory areas to excitation, whether painful or pleasurable in character.

Americans, perhaps beyond all other nations, are as a people living under such conditions of nervous strain as render them peculiarly susceptible to and impatient of suffering. If, as has been said, this is "an age of anesthetics," it is because it is an age in which the need for a deadening of susceptibility to painful impressions is widespread and imperative. The alchemy of to-day no longer seeks for the elixir of life, but for the nepenthe for life's every anguish. This found, the need for further search for the philosopher's stone has ceased, for in the isolation and synthesis of principles of pain obtundents modern chemistry has hit upon the true formula for transmuting to gold the lesser elements of the organic and inorganic world.

Paradoxically enough, while modern anesthesia owes so much to dentistry, dentistry of all branches of the healing art owes probably the least to anesthesia. Indeed, it has been claimed that by making painless the extraction of teeth millions have been sacrificed which otherwise would have been preserved for useful work. Certain it is, that could tooth-saving be made as painless as tooth-pulling, this regrettable result would be vastly modified for the better.

In a recent paper a "distinguished divine" is quoted as saying: "It is true you (dentists) are a long way in the rear of surgeons in

the matter of pain avoidance. There is a brutishness of persistence in operating that in the public mind stamps the dental chair as a place of torture, to be driven to as a last dreaded resort." While without important qualifications this severe arraignment cannot be accepted as entirely just, there can be no question that, whether justly or unjustly, our clinical critic has but voiced a widespread public sentiment. To paraphrase the words of Velpeau, pain and dental surgery are words "which never present themselves separately to the mind of the patient," and the ministrations of our art are universally regarded as among the minor ills of life not the less to be dreaded because inevitable.

That this condition of the public mind is to be deprecated, and that it constitutes a serious handicap to professional interests, material and otherwise, are self-evident propositions. Of all the many measures designed to advance professional welfare with which dental literature has been so prolific, nothing could approach in far-reaching efficacy any system or method which could secure a dentistry really painless and not at the same time more or less worthless. That the solution of this problem is attended by almost insurmountable difficulties every practical dentist knows. The chief trouble is not that there is a lack of pain-obtunding agencies, but that their successful application often demands conditions not readily attainable, and not infrequently calls for the employment of measures which are in themselves painful.

The most hopeful feature of the situation, however, is a notable modification of the point of view and a readjustment of values in dental practice. Hitherto the tendency has been to regard the treatment of the conditions arising from dental caries too exclusively from the mechanical standpoint, and to call "good work" only that which compactly fills with gold a carious cavity and more or less completely restores in that material normal tooth contours.

The truth is, however, that what may be very good work viewed solely in its mechanical relations to a tooth may be bad work for the tooth therapeutically, and for the patient very bad work systemically. Certainly no perfection of adaptation, strength or artistic finish in a filling can be regarded as the all-sufficient justification for an operation which causes hours of acute suffering and results in nervous collapse. When the dentist regards his professional duties from the true point of view such malpractice becomes impossible,

for his first thought is for his patient, whose physical and mental characteristics, susceptibility to suffering and powers of endurance all must be carefully considered in determining the character and extent of the restorative, protective and remedial operations to be performed upon the teeth and associated tissues.

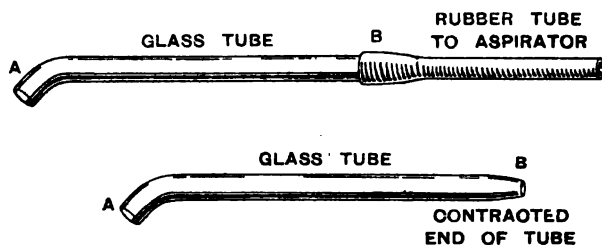
If what is somewhat fallaciously termed "permanent" work cannot be done without too great a strain upon the vital powers of the patient, the dentist of to-day has at his command a long list of filling-materials of reasonable durability, easily placed, and as readily renewed, and singly or in combination admirably adapted for a wide range of cases. His armamentarium holds also a large number of obtunding and anesthetic agents, by the use of which in a vast majority of cases painless instrumentation is possible.

The chief barrier to the more general and successful application of obtunding agencies in dentistry has been the element of time, which to the busy dentist, and hence, of course, to his patient, means money. By suitable office arrangements, however, it is entirely practicable, with or without an assistant, to perfect obtunding processes in an apartment or space separate from the general operating-room, thus leaving the dentist free to devote to other duties the period of delay.

While absolutely painless dentistry may long remain an unattainable ideal, there can be no question that the commandment, "Thou shalt not give needless pain," should be regarded as one of the most obligatory in the dental decalogue, and that he who best observes its spirit in the routine of daily practice will have wrought best for humanity, for himself, and for his profession.—*Editorial in Brief.*

REMOVAL OF PORTIONS OF SUSPICIOUS GROWTHS OR ULCERS IN THE MOUTH FOR MICROSCOPICAL EXAMINATION. By T. Law Webb, M.B., Ch.B. (Shrewsbury). I have made rather a special study of malignant diseases, carcinoma and sarcoma. Your president was kind enough to ask me to read a paper on Early Diagnosis of Malignant Disease of the Mouth. I was obliged to decline for the simple reason that I thought dentists knew a great deal more about that matter than the general practitioner. I can prove that by referring to two cases in which malignant disease was diagnosed by dentists in this town long before any doctor suspected it. In one case the epithelial growth was discovered by Mr.

Mugford in a medical practitioner. There the dentist distinctly scored off the general practitioner. There is this to be said, however, that when a patient with malignant disease of the mouth comes to the general surgeon he has a good big lump or a large ragged ulcer, which anybody can see is malignant, but there are cases where there is a suspicious little papilla or raised plaque, and there is a doubt. Sometimes you will find there is a suspicious ulcer with raised edges. The thing is, of course, to settle what that may be, and you generally have to resort to snipping off a piece of the mucous membrane for microscopic examination; and here as a pathologist I must entreat you to take a deep enough snip when you do take it, for it is exceedingly vexatious to find a tolerable large piece, as to surface, going hardly deeper than the mucous membrane. As epithelioma is



the common malignant disease of the mouth, you want to have some submucous tissue as well, to see if the epithelioma grows deeply down. I tried to get my *confrères* at the Infirmary to be particularly careful to take a deep cut, but they found this very difficult to do. I therefore suggested a little bit of apparatus which I thought would facilitate taking a good deep snip. The apparatus is composed of pieces of glass tube of little more than three-eighths inch in diameter and slightly curved at the end. These tubes are intended to be attached to an ordinary aspirator. On placing the tube on the little bit of tissue you wish to remove, and pressing it lightly down, you turn on the vacuum, and a papilla of mucous membrane is drawn up into the tube, so that with a pair of scissors it is tolerably easy to cut off a bit of the mucous membrane. The vacuum causes the little piece of tissue to pass into the tube, and you do not lose this. This simple apparatus has one or two advantages—it takes a deeper cut, it does not tear into rags the bit of tissue, and the little piece of tissue is not swallowed.

I do not wish to dwell upon the great importance of diagnosing

these cases. As a pathologist, I know it is all important that you should get a good piece because you cannot diagnose it absolutely if you do not get a piece large enough to make a proper section. Again, the position in which growths occur rather modifies the form of them. In the case of the medical man who had a fatal epithelioma, the epithelial growth sprang from the socket of a tooth which had been recently extracted. Another case occurred where the growth was upon the floor of the mouth just at the side of the tongue, a softish lump, thought not to be malignant, but which proved to be a mass of epithelioma. That impressed upon my mind the fact that epithelioma is a new growth, a tumor. We so often see it as an ulcer that you can hardly conceive of it as a new growth or tumor, but it is so, to begin with, in all cases.—*Jour. Brit. Dent. Assn.*

ORGANIZED WATER AS A FOOD. By John Uri Lloyd, Cincinnati. Read before the American Pharmaceutical Association, September, 1902. Some years ago a professional friend declined a dish of soup, stating that he did not care to load his stomach with so much water in order to obtain the trifling amount of nourishment it contained. Shortly after this the writer listened to an able paper read before the Cincinnati Section of the American Chemical Society on the subject of "Foods," and in this paper was struck by the fact that the nutrient value of the respective foods was determined through consideration of materials absolutely free from water, which brought to his mind the observation of the professional friend before alluded to.

Without a doubt the majority of people accept that the function of water in food substances is that of a solvent only or as an inactive vehicle provisioned only to carry food to tissue and bone. They believe that the object of water as a drink is to dilute the fluids, wash impurities from the blood, and carry off worn-out tissue. Water is not seriously considered in the light of an integral part of food by anyone, such solid substances as starch, sugar and nitrogenous and fatty tissues being usually cited as the constructive and heat-producing agents. Our works on digestion and on general physiology state that most foods are three-fourths water, and the human body, bones included, over two-thirds water, but yet consider water irrelevant as a nutrient. The upbuilding and tearing down of tissue, the production of salts and products of disintegration, both normal and abnor-

mal, are studied solely from the basis of molecular change, in which nitrogen, hydrogen, carbon and oxygen play their respective parts as such.

With this thought in mind, let us for a moment consider the part of water as an organizing structural agent in certain salts, because many inorganic crystals depend for their form and structure on water of crystallization. But, it may yet be argued, after having gone through the list and studied their various deportments, that crystals are dead structures; organic bodies are now the subject of discussion. Take, then, the jelly-fish, that transparent, quivering, vitalized something, shaped after laws as uniform in action as a mathematically-made creation can be. It possesses the power of voluntary action and lives upon structures seemingly much higher in life's scale; has the power of attacking the higher animals, and possesses in itself an individuality that renders it a living, moving creature. On being dried it almost disappears, leaving a film of varnish possessed of so little solid matter as to disturb the thought of one who attempts to argue that the water of this creature is simply water of association, devoid of any other quality than that of ordinary water.

Consider some species of fungi that spring up in a night and in the sun the next day dry to bare fragments of themselves. In their natural condition these water-structures partake not only of the attributes of their respective species, but are most marvelously exact in every detail, possessing qualities that seemingly forbid the thought that the great mass of water present is simply a carrier of insignificant amounts of solid matter.

The cabbage, the apple, the fruits of our orchards, the vegetables of our gardens, contain in all cases an enormous amount of water, if we consider the fluid part of the mysterious liquids present in vital juice and organic structure as simply water. Here we are confronted with conditions in which relationships between the large amount of water and the small amount of solid are such as to tolerate the view that this water of combination may be a something very different from pure water, or water obtained by tissue destruction. With such complex examples in mind, we are led consistently to inquire whether such dishes as soups and other aqueous liquids, and water-bearing or water-assimilating foods, can, as tissue-feeders, be in themselves anything beyond simple solutions of solid matters in water.

In order to make a nourishing soup it is not alone necessary to mix water and solid material. Good soup of complex composition requires for its production a certain amount of manipulation, such as boiling, seasoning and cooking. These processes are purely physico-chemical, and productive of numerous dissociation and combination products. The question is, has the water that is used in the making of a soup, by the action of heat, simply dissolved certain salts and tissues, or has it combined with organic constituents in a way that will make a nourishing liquid or a series of water combinations, in which water exists, it is true, but with altered qualities?

Nitrogenous food becomes a supporter of nutrition in a manner impossible in a case of pure nitrogen, which is not available as food and cannot be assimilated as such. Carbon as carbon, pure and simple, is useless as a food. Hydrogen serves its purpose as a food only when in combination. These three bodies are constituents of food, and when obtained by destruction of flesh and fat are cited by food theorists as a basis for calculating food values. Yet in a state of isolation they are not available as foods. Only when combined with water, or by means of water, do they become tissue-builders or heat-producers, and of this fact the analyst takes no account whatever beyond a bare reference to the presence of water as such. However, the object of the writer is not in any way to oppose the work that has given us the values of these elements as such, in nutrition. These investigations need not be disturbed, nor need the vital importance of these elements, even if full credit be given the province of the water molecule.

Nations widely separated may thrive upon food structures unknown to each other, but never does man or animal dispense with water of combination, and most animals must drink water as well as eat it. This fact of observation brings us to the question before intimated, as to whether it is possible for liquid foods, or foods hydrated during the process of mastication and digestion, to be possessed of chemical characters as yet outside the equation of our known chemical equivalents? In other words, do undetermined molecular combinations that ensue during cooking, as well as mastication, create complex, nutritive water structures, capable of carrying their qualities to the tissues they finally reach and nourish by reason of their easily alterable structures?

We call water driven off in the drying of fruit or food of any kind,

water of separation. May it not be rather the result of structural molecular decomposition? In the cooking of dry foods we not only change their structures as regards relationships of solid constituents, but add thereto the qualities that combined water gives under conditions as yet obscure. The same is true of vegetables and fruits. Should we not look on such water, necessary as it is to life, digestion, and tissue replacement, as an integral part of food, instead of simply a carrier of food? It is indeed probable that the student of dietetics must soon broaden his field and consider foods in their structural entirety, rather than from their analytical created ultimates. The method of the analyst now is to first kill the animal or vegetable, then destroy the tissue, then disrupt the molecules. The final result gives him inorganic elements and a few characteristic chemical structures, on which he bases his tables concerning food valuations. Is this just, in the light of what we know concerning the province of vitalized structures as a whole; is it rational, in the light of what we know concerning the worthlessness of chemical elements in foods? Is it not more rational to accept that the exceptional value of albumen and other nutrients, as typical foods, rests on the water compounds so nearly in accord with tissues craving just such vitalized water-bearing structures?

But to pass to a point beyond molecular water itself, which in both crystal and colloid tissue is capable of expulsion by desiccation. When organic matter is perfectly dried, a considerable portion of the residue is found to be composed of elements that might have been derived from or subsequently might be combined into water. Take from desiccated tissue the elements that might have come from water dissociation, and, comparatively speaking, we have but a small amount of residue.

Consider the soups, custards, gelatin, pies, fleshs, fish and fruits of all kinds, and even bread, which contain in themselves enormous amounts of water, in most cases the larger share of their weight being water, and observe the composition of the solid materials that remain after they are dried. These, too, are found to be made up of elements that in themselves may have been derived from water—fragments, we may say they are, of broken water molecules.

Consider the carbohydrates, dry as dust, sugar being typical of these, in which the elements of water are combined with carbon in the very proportions necessary to form water. The largest amount

possible of a water-producing compound (pulverulent water) is here artfully stored in contact with the great combustible, carbon. We have series of food solids, differing only in the proportion of water present (sugar, starch, glucose, etc.), and that many combinations of one substance and water in different proportions exist, is shown when we consider series of hydrated salts exemplified by such bodies as the crystalline manganese and sodium sulphates, etc. We should not suspect that such have an existence but for the fact that as definite water compounds they assume a visible form and become sensible to sight and touch. But of the liquid outreaches connected with changes in colloidal metamorphosis we know next to nothing. If this shading of compounds, differing only in water compounds, is true of such elementary salts and solid foods, may not water be combined in an untold number of liquid organic structures that are as yet invisible, uncrystallizable, unreachable to our senses as organized bodies?

But enough for the present. In a time to come it may be clearly seen that students of food and digestion have not given sufficient prominence to the one thing that supports life, governs life, nourishes life, that feeds all structures, that constitutes the larger share of all organic tissues, but that strangely enough in itself is now viewed as a carrier only of something else.

We feel justified in anticipating that the immediate future will give a more extended view than the circumscribed atomic theory affords, which to this date, as a stepping-stone, has served the world well. Shall we then perceive that the vitalized water of organized water-bearing foods, and the combined water of such foods as carbohydrates and fats, are the foundations of the real foods for tissues, affiliating other materials, such as nitrogen, carbon, hydrogen, necessary in their field, but subject to the dominating agent, water? Organic chemistry has been defined as a study of the migrations of the carbon atom. May we not anticipate that organic structures will then be defined as products of the migration of the water molecule?

Possibly the makers of food products of the future will give less attention to analytical values concerning dead elements and more to vitalized and vitalizing structures in which available water is conspicuous. Possibly it behooves us even now to ask if a closer inquiry into the water molecule, *the vitalized or easily vitalized water mole-*

cule and its many shadings, may not open up a field for the construction of more rational food products.

CLOSING SUPERFICIAL INCISED WOUNDS. Dr. A. G. Bretz (*Medical and Surgical Monitor*) believes his method very simple, and describes it as follows: Given a wound on the forehead, for instance, after cleansing and preparing it in the usual way, dry the adjacent surface thoroughly and then apply a piece of adhesive plaster on either side of the wound, the size of the plaster and the distance from the edge of the wound to be determined by the length and character of same. However, it should be of sufficient width to give ample area for adhesion, which should be not less than one-fourth of an inch and not nearer the wound than one-fourth of an inch. Raise the inner edges of the adhesive strips and insert interrupted sutures through them instead of through the skin, draw together and tie. This coaptates the edges of the wound even better than stitches through the skin. The wound is then dressed in the usual way. First, it prevents the painful process of inserting stitches, of which all patients have such a dread. Second, it does away with the possibility of stitch-hole abscess and the trouble caused by particles of sutures being left in the wound on removing the stitches. Third, it prevents the stitch-marks, which always add to the unsightliness of the scar. Fourth, in cases of wounds inflicted by a blunt instrument, which caused bruised tissue immediately surrounding the wound, there are no stitches to tear out the friable tissue. There is no puckering between the stitches; the first stitches coaptate the edges, and the others make the closure permanent. There are many other advantages besides those enumerated above.

TO ADJUST THE PARTS OF A BROKEN VULCANITE DENTURE AND GET A MODEL OF THE SAME. By Dr. Joseph H. Noble, Philadelphia. Pass a cake of modeling composition through the flame of a Bunsen burner until one surface is soft, the other surface remaining rigid. Lay the cake on a flat surface, soft side up, and press the occlusal surface of the artificial teeth into it, getting the pieces of the denture in approximately their proper relations. Then, using both hands, correctly adjust the several pieces. They will move readily in the soft composition and will stay where placed. Harden with cold water to prevent the accidental

moving of the parts. Now pour plaster into the lower part of a flask, and after placing some also on the palatal portion of the denture, place the denture in the flask. When the plaster has hardened remove the modeling composition, remove the pieces of the denture, and proceed as usual. The cake of modeling composition should not be much larger than the denture, at most not so large as the inside diameter of the flask. In the case of a broken lower it is sometimes advisable to run the cast first, not placing it in the flask until the compound has been removed. The same compound can of course be used again. Soften it in hot water and roll to the desired thinness on a piece of glass, with a roller such as is used by the photographer for mounting photographs. Excellent sheets of modeling compound for base plates may be made in this way.—*Cosmos*.

COMPLICATION FOLLOWING REMOVAL OF ADE-
NOIDS. By E. A. Montenyohl, M.D., Akron, Ohio. A female child, aged 5 years, suffering from a very aggravated form of enlarged tonsils and adenoids, was operated upon in the usual manner under chloroform narcosis. Nothing unusual was noted about the case until three days following the operation, when characteristic choreic movements were seen to develop in the muscles of the face and rapidly extended to the extremities. The child was extremely nervous and peevish and would cry out at the least excitement, and was unable to sleep without hypnotics. An acute endocarditis ensued and rapidly took on grave manifestations, with the temperature at 105° F., and respiration 50 for several days. Gradually the symptoms subsided, leaving a chronic heart condition, with the chorea not much benefited. About two months after the acute manifestations the choreic movements disappeared, and the child seemed to suffer little, except that when she played too hard she would complain of fatigue. Chorea and acute endocarditis following the removal of adenoids and enlarged tonsils is indeed very interesting and unique from an etiological standpoint. As there was no history of rheumatism in the family, I have thought that the complication might have arisen from some sort of infection from the seat of operation. The child did not appear to be frightened before the administration of the anesthetic.—*Pediatrics*.

Letters.**THE BOSS TAKES A DAY OFF**

(AS TOLD BY THE OFFICE BOY.)

One day says the Boss, "James, things ain't movin' at Lightnin' Speed in the Offis, an' I'm feelin' Low Sperited an' Dissatisfied, so I'm agoin' Fishin' to-day fer a Change. Dock Knowital, a bright young student in the Dental College, has agreed to keep Shop fer me. They say he's the Smartest one in his class, so I reckon you an' him kin manage matters all O. K. You show him where things is, an' kind o' help him out, James." So when Dock Knowital come I seen right away that he was Offul Conceity an' looked like he wouldn't take no Advice, an' I knowed I'd got to be Middlin' Firm with him, er he'd git the Upper Hand of me. Says I, "I'll start right with him." So after the Boss had went, I went in the Laboratory where Dock Knowital was Polishin' Up a Gold Tooth what he wore on his Scarf, an' says I, "I'm agoin' out a spell, Dock. You may Tend Bell till I come back. If people wants matters attended to that you don't understand, you have 'em wait till I git here. I won't be gone so long."

So then I looked reel Stidy an' Composed, an' went out. "Wait a minute," says he, "You've fergot somethin'." Says I, "What?" He never answered at first, but he walked up to me an' ketched me by the Ear, an' shoved me down in a Chair. He yanked off my Hat an' slung it in a Corner.

"You've fergot who's runnin' this Mill jis' at Present," says he, Sarcastic Like. "You've got Nerve enough to Tone Up a whole Surgical Ward. You ast me, nex' time you want to Go Out." I seen then it wasn't so Offul Urgent about me agoin', after all, so I set still, not reely wantin' to Rile him. Says I to myself, "You've got the Best o' this Game at present, Mister, but you wait an' you'll see where you Land before the Day is ended."

It seemed like Luck begun playin' right into my Hands from that Minute. The Bell rung, an' I let in Miss Watson, what's the Sourest old Maid in the city, an' the Boss he said he was expectin' to have a Dandy Time gittin' impressions of her Jaws before long. They was Four Lower front teeth that was so Loose they was liable to Drop Out every time the Clock Struck, an' the Upper Teeth wasn't much

better, an' they Stuck Out like a Fan, so that the Boss he insisted she'd got to haf a lot o' them Out, before he'd undertake to git a Impression. But Miss Watson she wouldn't heer to havin' a Single One o' the Lot pulled out, an' she insisted he'd got to git the Impressions, somehow, with them all in. So there it was, an' the Boss he said he'd haf to use the Dustpan fer a Tray, them Upper Teeth flared out so.

So then I called Dock Knowital, an' says I to him, on the Sly so as the lady wouldn't Heer, "Ef she wants you to take her Impressions, I wouldn't do it on no Account. The Boss he's been a-dreadin' to have her Come In, this long while, an' he said he'd give any man Ten Dolers to git him out o' the Scrape. Ef you don't want to git in Trouble you take my Advice, an' don't you have nothin' to do with the Case." Dock he Smiled pityingly, an' says he, "James, you set in the Hall an' Tend Bell, that's all you need Do. When I need your Advice I'll ask fer it."

So then I went back an' I told Miss Watson, says I, "They's a young man's got charge o' Matters to-day, the Boss bein' out o' Town, an' he'll come an' take the Impressions, presently." Then she riz up an' says she, "I prefer to have Doctor Contour do it; I'll call another Day." So says I, in a Low, Confidin' Tone, "Ef I was you I'd let Dock Knowital do it, fer he's got the latest improved way of takin' Impressions, an' he don't put you to the Slightest Inconvenience, an' it's reely a Pleasure to have Impressions took by him. An' the Boss he's gittin' kind o' Old, an' some says he can't see no more, at least not good enough fer takin' Impressions, an' he ain't Kep' up with the Times so Offul Well, an' he's losin' ground in the Perfession, like Sixty."

It seemed kind c' Mean to Knock the Boss thataway, but it was a Desprit Case o' havin' to Git Even with Dock Knowital, even ef it Totally Ruined the Boss's reputation. So then Miss Watson she seemed to Reckon it might do, after all, an' jis' then Dock Knowital a-comin' in from the Laboratory, abowin' an' Scrapin', she begun Simperin' an' Sniggerin' an' Makin' Eyes at him. Though his Actions ain't what I like, exac'ly, Dock Knowital he ain't so Bad Lookin', an' even while I was introducin' her an' him, I seen he'd made a Mash. But she still had Presents of Mind enough to ast him was he Gentle, an' had he ever had a Impression Took himself, an' was it reely so Offul Bad. An' Dock he said it wasn't, not a Bit,

ef you knowed your Business. Then he examined her Mouth, an' he said them Front Teeth had orter be out first, an' she said jis' what she'd said to the Boss—that she wouldn't part with one o' them teeth fer Money. So then Dock he concluded he'd Haf to do her Way, an' he turned to me an' says he, reel sharp, "James, the Bowl an' Plaster."

So I went out an' Brung them, an' I Brung a Tin Cup full o' the Hard Kind o' Plaster that the Boss uses fer makin' the Casts, 'cause I'd heered the Boss say it wouldn't Break so easy, an' I was afeard ef it did break it might break one o' them Long Teeth, at the same time. (This is what I explained at the Inquest, as you might call it, the Nex' Day, when the Boss ast me how it all Happened.)

So then Dock Knowital he borried a Big Tray from Dock Pea-body, fer the Upper Jaw, 'cause none of the Boss's was Big Enough, an' then he Mixed the Plaster an' Rammed it Home. While it was a-settin' says he, "James, they's enough Plaster already Mixed fer another Impression; what's the Matter with us takin' the lower Impression at the Same Time? It's a New Invention o' mine, an' they're agoin' to Adopt it at the Dental College." So I said that was indeed a Rowdy Idee, an' why couldn't the Boss never think o' New Ways, like that, an' then I filled a Lower Tray, reel quick, an' everything bein' ready Dock pried her mouth apart about Seven Inches, an' stuck that in too.

When she felt her mouth so Full Miss Watson she seemed to be Seized with a Sudden Panic, an' she made a Snatch to pull one o' the Trays out. Says Dock, "You mustn't do that; keep perfectly ca-am an' composed. Matters is progressin' finely." All the while she was a-gulpin' an' a-heavin', an' her Eyes looked Wild, like a Calf when the Butcher Boy twists his Tail to make him walk Spanish an' to help him Git up in the Wagon. Presently says Dock, "They're all done; now we'll take them Out"—like it was a Pan o' Biscuit bakin'.

Meanwhile I'd jis' come in from the Laboratory where Dock Knowital had a Rubber Job vulcanizin', an' I'd concluded I'd learn him a Lesson, so I'd took a Lighted Match an' held it clost to the Bulb of the Thermometer on the Vulcanizer. Says I, kind o' Off-Hand, like it was somethin' I'd jis' happened to Notice, "Dock, the Electricity in the Vulcanizer is up to 498, is that All Right?" You'd orter seen him jump! He Yelled, "Turn off the Gas, quick, quick!

She'll bust wider than a Barn, ef you don't!" Says I, lookin' kind o' like a Baby wonderin', "What'll bust?" He never gave me no answer, but he run in the Laboratory, an' presently I heered a mos' Turrible Sizzlin', like he was pourin' water on the Vulcanizer. "We've had a Narrer Squeak fer our Lives, James!" says he, Tremblin' so he couldn't hardly Talk. "What sort o' Blamed Machine is this, anyhow, to run up from 320 to 498 inside o' Four Minutes!"

"It's out o' order, I reckon," says I. Then after a Minute says I, kind o' like I didn't want to have him think I was too Smarty, "Do you reckon that Plaster is about Set Enough, yet?" He dropped the Vulcanizer like it had Exploded, sure 'nough, an' ran back in the Operatin' Room. Miss Watson she seemed to be havin' a fit o' the His Teeriks, by this Time, though to look at her abody might of guessed it was Mumps. She'd slid down on the Floor, an' the way she was Carryin' On reminded me of Days when the Boss has Seven Patients come a-Stringin' In, one after another, tellin' him his Plates is N. G. Dock Knowital he was Good an' Rattled by this Time, an' the mos' Heedless Observer could easy of seen he was in fer one o' the Sensations of a Life Time. He grabbed the Tray Handles, tuggin' an' jerkin' with Might an' Main.

"Come 'ere an' set on her Head, James!" he yelled, noticin' how Obstreperous Miss Watson was a-growin'.

Jis' as I was a-goin' to do it, out come the Lower Tray with them Four Front Teeth stickin' tight in the Plaster, the Whole Output lookin' like it wasn't only necessary to pack in the rubber an' Vulcanize it. "It's a Dandy Impression, sure's you're born, James," said he, winkin' aside at me, like he Hoped Miss Watson wouldn't notice the Accident. Miss Watson she was makin' Herculaneum Efforts to say a few Remarks, an' they'd of been P'inted an' Peppery enough fer the Average Man, I reckon, only she couldn't Say 'Em. Dock he was a-Pryin' at the Upper Tray, now, an' it seemed like he used Force enough to upset our Hall Stove, but it never done No Good, an' after a Spell says he, "All things considered I believe I'll jis' let this Upper Tray stay in a Hour er so, Madam, it'll make the Impression all the Better." He let on like it was the way dentists done sometimes, an' nothin' Supprisin' at all. I knowed Well Enough, though, it was only to Gain Time an' find out what to do. So Miss Watson she Made Motions fer a Pencil an' some Paper, an'

she writ somethin' fer him to Read, an' I seen it. It said: "You send for some Dentist what understands his Business, to get this Muss out o' my Mouth, right away, er I'll have you Prosecuted. I mean it!" An' you could easy see she did, too.

Then Dock Knowital he was reely Dreadful Flustered, an' Pale about the Mouth, like he was Suddenly ketched with a Attack of Pyorrhea. But he made a Grand Rally presently, an' put up a Stiff Bluff. Says he, "I have methods of practice peculiarly my own, Madam, an' I must insist on bein' the Doctor, an' can't allow my Patients to Dictate to me. If you are dissatisfied I must refer you to another Dentist." Miss Watson she still didn't Say Nothin', so then Dock Knowital says he, more Soothin', "Ef you care to take Time to Think it Over, perhaps you'd better Come Back after Lunch, an' we'll try to arrange this matter Amicably. I don't want to have no Misunderstandings with my patients. You kin Pull Down your Vail, an' you'd best not take mutch Solid Food fer the Present."

Miss Watson she begun writin' another Message, an' she made the pencil Hump so it seemed to Spit Fire, the same as her Eyes was adoin'. Jis' as I was alookin' over her Shoulder to see what kind of a Hot Poultice she was a-mixin' fer him, Dock he yanked me back by the Collar, an' out in the Hall. He Hissed in my Ear like a Pizen Adder: "You Cock-Eyed little Cooky-Smuggler, I've a Notion to crack your Head, fer gittin' me in the Worst Fix of my Life. Now you listen here; you scoot over to the Dental College an' you tell Dock, oh—*what's* his name, the Perfessor of Prosthesis, to hurry over here Quick, in the name o' Sufferin' Humanity an' one o' the Bright Lights of the Senior Class up a High Tree. Tell him to bring a Crow-Bar an' Gas Tongs, an' not to lose a Minute. To save time you kin Explain what's Happened while he's gittin' ready. Now Scoot!"

I was agoin', all right, when who should appear, grumblin' an' seemin'ly cussin' to himself, but the Boss, comin' in the Back Yard Gate. It seems he'd fergot his Bait Bucket, settin' by the Pump. It didn't take Dock Knowital long to call him in an' show him the Freak. Says he, Offul Solemn, while the Boss was sizin' up the Disaster, "It's a New Idee, as I understand it, to leave the plaster in a Hour er so, like our Perfessor o' Prosthesis learns us." Says the Boss, reel Rude, "Leave th' Devil in! Ef I git this out without bringin' the Palate Bones with it, I'll think I've got you off cheap!"

So then the Boss he went to work with his Engine, an' he gouged through the Plaster, an' what with whittlin' at it, an' pryin' an' Fussin', in about a Hour he'd got it all out, an' only Two Teeth, this time. An' then the things Miss Watson said to both o' them, you wouldn't of Believed she was Infant Class teacher in Sunday School, never fer a Minute. Dock Knowital he Snuck Out the room an' Disappeared, an' after a Spell the Boss he seemed Seized with a Panic, an' he Rushed Off without his Hat, an' Snatchin' Up his Bait-Bucket, shinned Head-First over the Back Fence.

I helped Miss Watson pry the Teeth out of the Plaster, an' she give me a Cent, an' said I was the Only Gentleman on the Premises. Then she Went Away.

Cincinnati, O.

FRANK W. SAGE, D. D. S.

LEUCOPLASIA BUCCO-LINGUALIS.—M. Bockhart has had sixty patients with this affection. All were men, all smokers and all were syphilitic. The leucoplasia became aggravated usually under mercurial treatment, but could be cured by rinsing out the mouth six to twelve times a day with a .5 to 3 per cent saline solution. The cure was complete in three months to two years, even when smoking was not entirely abandoned. In some of the patients he had the patches rubbed first with balsam of Peru. His patients carry a bottle of the saline solution in their pocket so as to rinse the mouth frequently during the day. Two of the five, who were thus cured so completely that not a trace is left of the trouble, have resumed smoking. When the patients refuse to give up tobacco, at least during treatment, much benefit can be derived from the saline rinsings, but no permanent cure. He found that the leucoplasia became aggravated after application of caustic measures.—*Monatslo. f. Prakt. (Jour. A. M. A.)*

INSTRUCTION IN CARE OF TEETH ought to be made part of the elementary school course in physiology and hygiene. So much depends upon cleanliness and health of the mouth and the teeth that the reasonableness of this proposition will be at once recognized. The decay of the temporary teeth may work lasting injury. Digestion is frequently impaired by imperfect mastication, due to defective molars. The presence of microbes bred in particles of food left between the teeth is often the source of serious stomach troubles. Nervous difficulties of various kinds can be traced to neglect of the teeth, and the inference that the development of serious lung diseases has resulted from a neglected mouth is by no means far-fetched. The wisdom of increased attention to the education of children in the things affecting their present and future health and strength is evident to every intelligent adult. Therefore no opposition from school officers ought to be encountered in introducing lessons on the care of the teeth and mouth in the elementary schools.—*School Journal*.

The Dental Digest.

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At 2231 Prairie Avenue, Chicago,

Where All Communications Should be Addressed.

Editorial.

THE NATIONAL MEDICAL UNIVERSITY AND THE INTERNATIONAL COLLEGE OF DENTAL SURGERY.

A correspondent has written us, inquiring about the Dental Department of the National Medical University, of 531 North Wells Street, this city. As there may be others desiring the same information, we deem it best to answer this inquiry in the columns of the DIGEST. It has been believed for some time by many that the dental department of this institution was very much of a "fake."

On the first day of the recent meeting of the State Board one William E. Busby, who claimed to have matriculated in the dental department of this institution in the year 1899, came before the Board and presented a diploma issued by its faculty, showing him to be a graduate thereof in dental surgery, and demanded that a license to pursue the practice of dentistry in the State of Illinois be issued to him thereon.

No recognition ever having been given the dental department of this institution, the question of "reputability" was opened up. At a subsequent session of the Board, W. C. Emerson, Chairman of the Board of Directors of the institution, Dr. L. D. Rogers, the Registrar, and Dr. A. L. Whipple, Dean of the Dental Department, appeared before the Board to establish the claims of the institution to recognition. The Board claims to have made a most thorough investigation of its dental department, its systems, faculty, facilities and management.

It was admitted by the Registrar that diplomas bestowing the honorary title of Doctor of Dental Surgery had been sold for money; that at the time of this occurrence the dental department of the institution had no recognition in Illinois, the state in which it exists; that the purchasers were foreigners, who knew but little of the English language; that they had never matriculated at the institution and

their sole examination was by Dr. Whipple, the Dean, occupying about three hours in the evening, who was aided by an interpreter; that the candidates were examined by no other member of the faculty and did no prosthetic or technic work in the institution, but brought their specimens of work from outside the institution, in at least one case of which it was known to the Board that the work was borrowed by the applicant for the honorary degree and exhibited as a specimen of his own art, and was accepted as such by the Dean.

In support of his action in the matter of the sale of these diplomas to Karl Adolph Loerz, William Nuthmann and others, the startling statement was made to the Board by Dr. Rogers that he had advised with Dr. Julia Holmes Smith, the Dean of the National Medical University, and that she had concurred with him in the legitimacy and propriety of the transaction. The Board also had before it the sworn statement of Dr. Earnhaus, a graduate of Berlin University, who matriculated in the Dental Department during the present year, and who complained to the Board that the institution contained no adequate facilities for instruction in or the study of Dentistry; that during the several weeks of his stay as a student the only clinic work done was the cleaning of teeth.

Dr. A. E. Warner, a reputable dentist at Evanston, Illinois, sent a communication to the Board, saying that he had been visited by a representative of the fraudulent St. Luke's Hospital, of Niles, Michigan, who had offered to sell him a membership in St. Luke's and a scholarship in the National Medical University. This call by the agent was soon followed by a letter from Dr. Rogers to Dr. Warner, inviting him to call that he (Rogers) might make him a proposition. Dr. Warner claimed and Dr. Rogers admitted that they were strangers to each other. Dr. Warner had asked the Board what kind of a proposition they thought Dr. Rogers desired to make to him, and this inquiry was turned over to Dr. Rogers, but he was unable to make any statement or explanation that would divert the mind, not even suspiciously inclined, from its natural conclusion. We are advised by members of the Board that there were many other matters within their knowledge derogatory to the institution.

The Board rightly determined that they could not recognize the institution as "reputable," as shown by the following letter to Drs. Rogers and Whipple, announcing their conclusions:

"Sirs:—The Illinois State Board of Dental Examiners have this

day voted against recognizing the diploma in the hands of Mr. William E. Busby, issued by the Faculty of the National Medical University, and no license to pursue the practice of Dentistry in the State of Illinois will be issued to him on his diploma. This conclusion is arrived at after a patient and, as the members of the Board think, quite thorough investigation of its standing in every particular, management and methods of doing business. The Board are of the opinion that the institution has not conformed to the spirit of the law and the rules of the Board, and that its management has been guilty of evil practices incompatible with good reputation, and that it is not at this time entitled to recognition as a reputable dental college."

The International College of Dental Surgery is the name of an institution claiming to have established itself in a third story flat of six or seven rooms at 182 West Van Buren Street. A William Feltmann is represented as the dean of this institution. It set up business once at 52 State Street and was examined into by the State Board, since which time it is claimed by members of the Board that they have made several efforts to inspect it during what should be, under the rules of the Board, its college hours, but always found its doors closed. This was notably the case on the first day of the last meeting of the Board, when two of its members, after visiting it at three o'clock in the afternoon, returned and were compelled to report that they could not gain admission, that the doors were all fastened and the premises deserted. The dean and the financial backer of the institution, an ex-representative in the state legislature, attended before the Board at one of its sessions and sought recognition or the promise of recognition as an inducement for them to obey the law and observe the rules and regulations of the Board. The institution failed to establish itself as "reputable."

ECHO OF THE HUXMANN CASE.

At the instance of the Illinois State Board of Dental Examiners, the State's Attorney of Cook County recently filed in the Superior Court informations in the nature of quo warranto against the following named holders of State Board licenses, for a judgment of ouster declaring their licenses void: Emil Gumbolt, Hermann Kuhling, Paul Splitgerber, Johannes Fuchs, Catharine Schumacher, Bernhard Fuchsberger, Hans Lange, Richard Breitfeld, Anton Hofer, Carl Beutelrock, and Oscar Stahl, eleven in all, and it is

understood that there is a large number of like cases to be dealt with as soon as all the facts can be collected and the papers prepared. The charge in some cases is that the holders of the licenses never appeared before the Board for examination, in others that they failed in their examinations, and in all that the licenses were improperly issued. The informations in each case are founded upon the affidavit of the secretary of the Board. Ten of these licenses were issued while Smyser was secretary, and his name appears on each of the ten licenses. One was issued while L. L. Davis was secretary, and bears his signature. Nearly all, if not all, of the persons proceeded against have been students at the German-American Dental College. It is claimed that some of these licenses are forgeries, and this is stated to be true in the cases of Gumbolt, Fuchs, Hermann Kuhling and others. There are several affidavits to this effect.

FUTURE OF THE DENTAL PROTECTIVE ASSOCIATION.

The fifteenth annual meeting of the Protective Association will occur Monday, Dec. 15, 1902. This will be of greater importance than any previous meeting, from the fact that ways and means for enlarging the scope of usefulness and making sure of the permanency of the organization will be discussed. Committees have been appointed by several societies to devise and recommend plans for a permanent organization, and a full consideration of this important move will be had at this meeting, as we hope to have plans and suggestions from these various committees. It must be apparent to all that the present organization must eventually be disbanded or it will die from inanition and lack of support, but it is the universal sentiment among the members that the present body must not be given up until some form of permanent organization is worked out. No one doubts that we must have some organization to guard against the numerous impositions and abuses which will certainly be practiced upon the dental profession unless some safeguard is at hand to forestall them. The older members of the profession realize this if the younger ones do not. The patent sharks realize that the end is probably near, and they are already beginning operations, as we are in receipt of letters from all over the country asking about the validity of patents on which certain individuals are selling office rights and threatening suits. An organization to be permanent must be laid on

different lines than the Protective Association has been, for in this case a few protected many, interest lagged except when suits were in progress, and all the work devolved upon one man, which will hardly be the case again. We invite not only the members, but all our readers, whether they belong to the Protective Association or not, to offer suggestions on this question, as the future outcome concerns the welfare of every dentist in active practice.

Notices.

JEFFERSON COUNTY (N. Y.) DENTAL SOCIETY.

The annual meeting of the Jefferson County Dental Society will be held at the Woodruff House, Watertown, N. Y., Dec. 8. The profession is cordially invited to be present.

PENNSYLVANIA BOARD OF DENTAL EXAMINERS.

The Board of Dental Examiners of Pennsylvania will conduct examinations simultaneously in Philadelphia and Pittsburg, Dec. 16-19, 1902. For application papers or other information address Hon. James W. Latta, secretary Dental Council, Harrisburg.

G. W. KLUMP, Secretary.

OHIO STATE DENTAL SOCIETY.

The thirty-sixth annual meeting of the Ohio State Dental Society will be held at the Great Southern Hotel, in Columbus, Dec. 2-4, 1902. This promises to be one of the largest meetings ever held in the history of the Society. Prominent members of the profession will present papers, and some of the most noted clinicians will operate. Arrangements have also been completed for one of the most extensive exhibits of dental aids and appliances ever seen. A cordial welcome is extended to all members of the profession.

OTTO ARNOLD, President, Columbus.

S. D. RUGGLES, Secretary, Portsmouth.

RESOLUTIONS BY ST. LOUIS DENTAL SOCIETY.

WHEREAS, The St. Louis Dental Society has delegated no authority to any organization, or to any person or persons, to extend to the executive council of the International Dental Federation, recently convened at Stockholm, Sweden, an invitation to hold the fourth International Dental Congress in the city of St. Louis during the Louisiana Purchase Exposition, to be held in said city in 1904; therefore,

We, the St. Louis Dental Society, hereby express our hearty disapproval of such assumption of authority, and also hereby express our regret that the National Association of America deemed it fit to entirely ignore the action of the above-named dental organization of the city of St.

Louis, who had appointed a committee to represent them in the matter of International Congress; therefore, be it

Resolved, That the St. Louis Dental Society assume no responsibility whatever regarding the approaching congress.

SOUTH DAKOTA EXAMINING BOARD.

The South Dakota State Board of Dental Examiners will hold its next meeting, for the examination of candidates for license to practice dentistry in South Dakota, at Mitchell, Jan. 7, 1903, beginning at 9 a. m. All those that wish to appear before the Board at this time must make application to the secretary on or before Dec. 30, 1902. Candidates are expected to bring operating outfit, material and patient.

G. W. COLLINS, D. D. S., Sec'y, Vermillion.

MCLEAN COUNTY (ILL.) DENTAL SOCIETY.

Twenty-three dentists of Bloomington and vicinity recently held a meeting and organized the McLean County Dental Society. The following officers were elected: President, F. H. McIntosh; vice-president, J. H. Campbell; secretary, B. M. VanDervoort; treasurer, D. M. Field; executive committee, G. D. Sitherwood, J. S. Reece, O. J. Jarrett; board of censors, J. W. Crigler, J. B. Brown, J. M. Gallahugh. Constitution and by-laws were adopted and the code of ethics of the state society was endorsed. Every one present was enthusiastic, letters were received from many dentists pledging their support, and the outlook for a successful society is very promising. All dentists in McLean and adjoining counties are invited to become members. Monthly meetings will be held, at which dental subjects will be discussed, and the social feature will be encouraged. We hope to be in shape to entertain the state society here next year in a fitting manner.

B. M. VANDERVOORT, Secretary, Bloomington.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

The Pennsylvania Association of Dental Surgeons held its fifty-sixth annual meeting, Oct. 14, 1902, at the Continental Hotel, Philadelphia. The following officers were elected to serve during the ensuing year: President, Dr. Wilbur F. Litch; vice-president, Dr. Geo. W. Cupit; secretary, Dr. J. Clarence Salvas; treasurer and librarian, Dr. Wm. H. Trueman. During the past year the following papers were read and discussed before the Society: "Combination Fillings," by Dr. Joseph Head; "Obtundents," by Dr. Chas. S. Moore; "The Difference in Method of High and Low Fusing Porcelain for Filling Teeth," by Dr. W. A. Capon; "A Practical View of the Plastics," by Dr. J. Clarence Salvas; "Alveolar Abscess, Its Complications and Treatment," by Dr. J. F. Wessels; "The Danger of Infection of the Eye of the Dentist While Operating," by Wendal Reber, M. D.; "The Calcification of the Dentin and Enamel and Its Relation to Hypersensitiveness of These Tissues," by Dr. I. N. Broomell; "Adenoids and Their Relation to Oral Deformity," by

Dr. M. I. Schamberg; "A Sketch of Edward Hudson," by Dr. Wm. H. True-
man; "General and Local Anesthesia, With Special Reference to Its Appli-
cation in Operations Within the Mouth," by E. Quin Thornton, M. D.

J. CLARENCE SALVAS, Secretary.

INSTITUTE OF DENTAL PEDAGOGICS.

The tenth annual meeting of the Institute of Dental Pedagogics will be held in Chicago, Dec. 29-31, at the Palmer House. All who are interested in dental education are cordially invited to attend. The following program has been arranged: Papers—"Teaching Operative Procedure," Dr. C. N. Johnson; "Teaching General Anatomy to Dental Students," Dr. Borland; "Teaching Electricity and Its Dental Uses," Dr. W. A. Price; "Teaching Embryology," Dr. I. N. Broomell; "Teaching Applied Physics," Dr. G. V. Black; "Physical Diagnosis," a symposium on the "Management of the Teaching of Demonstrators in the Infirmary," by four professors. Report of committee on "Four-Year Curriculum." Report of committee on "Nomenclature." All new teaching appliances must be submitted to Dr. W. H. Whittlar of Cleveland, or to Dr. J. D. Patterson of Kansas City.

HART J. GOSLEE,

President.

W. EARL WILLMOTT,

Chairman of Executive Board.

H. B. TILESTON,

Secretary and Treasurer.

RESOLUTIONS BY VALLEY DISTRICT DENTAL SOCIETY.

WHEREAS, It is with deep regret that this Society learns of the death of our esteemed fellow member, Dr. J. Searle Hurlbut, and we desire to express in a formal manner our appreciation of his life and a sense of the loss we have sustained; and,

WHEREAS, By his strong personality, his broadly cultivated views, his refined manner and dignified bearing, he was one of the leaders in influencing an intelligent public to that just appreciation of the dental profession which later years have witnessed; therefore, be it

Resolved, That in the death of Dr. Hurlbut the members of this Society feel they have sustained a personal loss and the dental profession one of its eminent members; and be it

Resolved, That we extend to his wife our most sincere and heartfelt sympathy; and be it further

Resolved, That a copy of these resolutions be sent to his wife, to the various dental journals, and to the daily papers.

GEO. A. MAXFIELD,

C. T. STOCKWELL,

N. MORGAN,

Committee.

Nov. 17, 1902.

JARIUS SEARLE HURLBUT, D. D. S.

Dr. Hurlbut died suddenly from apoplexy, Nov. 9, 1902. He was born in West Springfield, Mass., Jan. 5, 1842, being one of six children, five of whom were sons, and of these three died at the age of twenty-one. When he was ten years of age his parents moved to Springfield. He graduated from the high school of that city in 1860. Soon after he went into the office of his brother, Dr. C. S. Hurlbut, Sr., with whom he was associated for several years as student and partner. He attended the Philadelphia Dental College,



J. SEARLE HURLBUT.

graduating in the class of 1865. His health being poor after graduating, he went to St. Paul, where he practiced for a year. In 1866 he opened an office at 374 Main Street, Springfield, where he remained for twenty-seven years. In December, 1893, when the Masonic building was completed, Dr. Hurlbut, with his nephew, Dr. Allis, leased the corner suite of rooms.

In the Connecticut Valley the name of Hurlbut almost suggests the word dentist, for three of Dr. Hurlbut's brothers and two of his nephews have studied for the profession. He was a member of the old Connecticut Valley Dental Society—the leading dental society in New England—from 1865 until 1895, when it was merged into the Northeastern Dental Association, of which his membership continued until his death. He became a member of the

Massachusetts Dental Society in 1873, and was thus one of the original members of the Valley District Dental Society. He was also a member of the American Academy of Dental Science of Boston, of the Odontological Society of New York and of the National Dental Association. He was honored as president by the Connecticut Valley Dental Society in 1873 and by the Massachusetts Dental Society in 1874. When the dental law was enacted in 1887 he was appointed by Gov. Ames a member of the Board of Registration in Dentistry. In 1891 he was made president of this Board, which office he held until he resigned his membership, in 1896.

It will be seen from this brief sketch that Dr. Hurlbut was active, studious, alert and progressive from his early youth. In his death the profession and the community in which he lived have sustained a severe loss. As a friend Dr. Hurlbut excelled, and anyone who had ever enjoyed his hospitality had something to always remember with pleasure. He always stood firmly for the upbuilding of his profession.

News Summary.

J. W. SAWYER, 68 years old, a dentist at Boston, died Oct. 30.

F. E. MIX, for many years a dentist at Hartford, Conn., died Oct. 19.

B. RATHBUN, 67 years of age, a dentist at Dunkirk, N. Y., died Nov. 13.

W. B. MAXON, 60 years of age, and formerly a dentist in Alabama, died Oct. 29.

L. P. BLAIR, 40 years old, a dentist at Minneapolis, died Nov. 14, from Bright's disease.

W. P. IVES, 45 years old, a dentist at Brooklyn, died from an overdose of morphin, Oct. 30.

C. R. BOTELER, 63 years of age, a retired dentist of Baltimore, died in New York, Oct. 18.

E. P. SMALL, 43 years of age, a dentist at East Providence, R. I., died Nov. 10, from meningitis.

A. B. MASON, 69 years of age, a dentist at Toledo, O., died Nov. 12, from an explosion of gas.

J. M. MELLE, for several years in practice at Knoxville, Tenn., died Nov. 13, from tuberculosis.

CHARLES LEWIS, 40 years of age, a dentist at St. Anthony, Idaho, died Oct. 26, from heart disease.

A. W. ELDRIDGE, 59 years old, a dentist at Big Rapids, Mich., died Oct. 23, from a stroke of epilepsy.

P. T. HULL, 43 years old, a prominent dentist of New York City, died Nov. 17, from consumption.

KNOCKER.—A dentist in Wisconsin is advertised in the town paper as having bought "a new double back-action non-painless mallet for extracting teeth,

which is endorsed by all leading authorities." Probably he is going to knock out the teeth.

J. A. TROUTMAN, 65 years of age, a dentist at Ft. Scott, Kan., died from an overdose of morphin, Nov. 9.

T. L. COBB, 47 years old, a dentist at Montgomery, Ala., died Nov. 1, from injuries received in a runaway.

J. D. KNOWLES, 62 years old, and for many years in practice in San Francisco, died Nov. 23, from heart failure.

EDGAR D. SWAIN, for many years a dentist of Chicago, and lately of New York State, has opened an office at Batavia, Ill.

FIRES.—A. C. Seiser, Keytesville, Mo., Oct. 27, total loss.—H. D. Wilson, Bainbridge, Ga., Oct. 22, total loss, partial insurance.

R. L. LILLARD, 23 years of age, a dentist at Merced, Cal., accidentally killed himself, Oct. 20, by an overdose of nitrous oxid gas.

H. GULMYER, a young dentist at Elkhart, Ind., recently shot and probably fatally wounded a young woman of whom he was jealous.

HOW LONG DEAD?—A Missouri newspaper says: "Dr. Deadman has opened a dental office. He is a past master in his profession."

MILLER WINS GOLF CHAMPIONSHIP.—Dr. W. D. Miller, the famous dentist of Berlin, recently won the golf championship of Germany and Austria.

GOOD ADVICE.—Winks: "What advice did the dentist give you when you went to him this morning?" Blinks: "He advised me to go to some other dentist to whom I didn't owe \$25."

WORCESTER (MASS.) INSTITUTE OF STOMATOLOGY held its regular monthly meeting Nov. 12, and elected the following officers: President, A. F. Wheeler; secretary, R. R. Stimpson.

AGE TOLD BY DENTISTS.—Factory inspectors in Illinois are successfully enlisting the aid of dentists to tell by the teeth the age of children whom they think are too young to work in factories.

TWO KINDS OF COURAGE.—Dentist's Daughter: "Well, have you asked papa for my hand?" Wooer: "No, every time I step into his office I lose my courage—to-day I allowed him again to pull a tooth."

ROXBURY (MASS.) DENTAL ASSOCIATION held its annual meeting Oct. 9, and elected the following officers: President, A. Wongenroth; vice-president, I. H. Small; secretary and treasurer, W. F. Gray.

STERILIZING THE MOUTH-MIRROR.—Sodium peroxid is an immediate and perfect sterilizer, applicable to almost anything, and especially to the mouth-mirror and other things which cannot be boiled.—*Items*.

PEORIA (ILL.) DENTAL SOCIETY held its regular meeting Oct. 23, and elected the following officers: President, J. P. Luthringer; vice-president, C. E. Collamer; secretary, R. L. Graber; treasurer, George T. Gray.

THIOCYANATE IN HUMAN SALIVA.—E. C. SCHNEIDER (*Am. J. Physiol.*). In smokers, the average percentage of potassium thiocyanate is 0.013; in non-smokers, 0.003. The amount diminishes on prolonged stimulation of the

salivary glands. The parotid saliva is always richer than the submaxillary saliva of the same person at the same time.

BENZINE is one of the best things for cleansing the skin after ointments have been used, and for removing sticking plasters. It is cheaper than ether, does not produce a cooling effect, and causes no irritation.—*Franks*.

HUNTINGTON COUNTY (IND.) DENTAL SOCIETY was organized Oct. 26, and the following officers were elected: President, A. H. Wagner; vice-president, T. H. Hague; secretary, W. M. Strauss; treasurer, W. H. Weybright.

TO MEET THEIR NEEDS.—Mrs. Oldun: "People seem to have more trouble with their teeth nowadays than they used to." Oldun: "True, my dear, but just think how many more dentists there are to be supported than there used to be."

VULCANIZING ON PLASTER MODELS.—A model upon which rubber is to be vulcanized should be as deep as it is wide, or the expansion of the plaster will be unequal, the model will alter in shape, and a badly-fitting case will be the result.—*Ex*.

SURE SIGN.—"Doctor, is the nerve dead?" "Yes," at the same time pulling another installment of putrescent pulp from the canal. "How do you know?" "By the same sign given by Martha at the grave of Lazarus: 'Lord, by this time he stinketh.'"

ABOUT TIME.—In one of the Philadelphia colleges a professor asked a student: "Now, suppose you were called to a patient who had swallowed a heavy dose of oxalic acid, what would you administer?" "I'd administer the Sacrament."—*Argonaut*.

CARPETS VALUABLE.—A dentist in Kansas recently realized \$35 from the sale of an old carpet to a refiner, who got more than that amount of gold out of it. Several dentists report that refiners will give them a new carpet each year for an old one.

LEHIGH VALLEY (PA.) DENTAL SOCIETY was organized Oct. 21, 1902, and the following officers were elected: President, V. S. Jones; vice-president, W. C. Meddaugh; secretary, H. W. Wiltberger; corresponding secretary, H. W. Solt; treasurer, J. C. Hertz.

VACCINATION EFFICACIOUS.—In the Island of Porto Rico a general vaccination (860,000) was completed on June 20, 1899. Since then the island has recorded just 3 deaths from small-pox in two years. The average for ten years previous was 629.—*Med. Times*.

S. J. COCKERILLE, 72 years of age, a dentist at Washington, D. C., died Sept. 9. Dr. E. P. Beadles says: "He was in active practice up to 1899, and was a successful dentist of the old school, never using a dental engine, and doing contour work with non-cohesive foil."

SUPERVISION OF THE TEETH OF SCHOOL CHILDREN IN DENMARK.—The town of Frederiksberg in Denmark has hired a dentist to inspect the teeth of the school children regularly twice every year. Parents are notified by a printed circular whenever the teeth of their children are found to need attention.

The supervision extends to both the public and private schools, and has proved a most salutary measure, as was officially announced with details at the recent Danish dental congress.

FATALITIES.—Oct. 30, a woman 39 years old died suddenly from heart disease while a dentist was examining her teeth, with a view of extracting some of them. Fortunately for him, she had not yet taken the anesthetic.

NO PAY, NO TEETH.—The police were recently called to a dentist's office in New York City by the friend of a man whom the dentist would not allow to leave his office until he had paid for a set of teeth. The "prisoner" finally gave security for the bill and was allowed to depart.

NATURAL MISTAKE.—Patient: "Didn't you say you were going to put a bridge in there?" Dentist: "Yes, that's what I am doing." Patient: "Well, I suppose you know your own business best, but from the way you started I thought you were going to dig a tunnel."

SOUTHERN CALIFORNIA DENTAL ASSOCIATION held its fifth annual meeting at Riverside, Cal., Oct. 20-21, and elected the following officers: President, J. W. White; first vice-president, C. S. Lane; second vice-president, J. W. Neblett; treasurer, A. T. Covert; secretary, L. E. Ford.

BOGUS SOLICITOR.—The publishers of *Success* wish to warn the dentists of the country against a swindler who claims to represent that magazine and takes subscriptions for it. He is not an authorized solicitor and never turns in the money received. All regular solicitors have credentials.

NEW COMPLAINT.—Askit: "Whatever became of that patient of yours you were telling me about last spring?" Dr. Sokum: "Oh, he's got a complaint now that's giving me a great deal of trouble." Askit: "Indeed! What is it?" Dr. Sokum: "Its about the amount of my bill."—*Philadelphia Press*.

GOOD WORK.—In Seattle, Wash., a jury has pronounced Dr. James G. Stewart, a regular physician of that city, and O. V. Lawson, an applicant for license from the board of registration, guilty of conspiracy to defraud. Dr. Stewart agreed to furnish in advance the questions for the medical examination; he gave Lawson an old set, and Lawson then exposed Stewart and arrest followed.—*Jour. A. M. A.*

DIVORCES.—Dr. O. C. Hiatt, a dentist at Forest Grove, Ore., has brought suit for divorce against his wife.—Mrs. J. J. Phelan has brought suit for divorce against her husband, a dentist of Denver.—J. C. Littler, a dentist at Albany, Ore., has secured a divorce from his wife on the ground of desertion. It is stated that she left him because he would not allow her to practice dentistry in his office, although she was a graduate.—W. S. Sweet, a dentist at Denver, formerly of Iowa, has sued his wife for divorce.

MARRIED.—E. R. Bender, Columbus, O.—Alice Goodwin, Malta, O., Oct. 20. Isaac Burton, Colorado Springs—Marie Williams, Colorado Springs, Oct. 27. H. J. Hanson, La Crosse, Wis.—Anna Erickson, La Crosse, Nov. 14. G. R. Hanna, Rochester, N. Y.—Anna Jane Ross, Rochester, Nov. 3. C. A. Hawley, Oakland, Neb.—Clara B. Eichenberger, Bertha, Neb., Oct. 22. W. H. Lockhart, Traverse City, Mich.—Florence O. Rosenthal, Traverse City, Oct. 21.

T. A. Lee, Bowling Green, O.—Anna H. Poe, Fostoria, O., Oct. 29. J. E. Long, Leroy, Ill.—Mary E. Johnson, Farmer City, Ill., Oct. 29. David Smith, Chicago—Ruth Smith, Chicago, Sept 28. H. Thomsen, Beemer, Neb.—Elizabeth Granz, Omaha, Neb., Oct. 15.

ROBBERIES.—Nov. 6, Dr. Gustavus North of Cedar Falls, Ia., was robbed of \$100 worth of gold and material. The thief climbed over the transom of the office while the doctor was at dinner.—Oct. 22, a dentist at Ottumwa, Ia., lost about \$200 worth of gold and material.—Nov. 8, a dentist at Cleveland was robbed of \$75 worth of stuff.—Nov. 1, a dentist at Wells, Nev., lost a considerable amount in gold.

POLICEMAN RUNS AMUCK.—An oversized policeman at Cincinnati went to a dentist to have five teeth extracted. After the dentist had administered chloroform for a few seconds the officer became crazed and nearly wrecked the furniture before the effects of the drug passed off. He was then taken to a hospital, and this time it required five men to hold him until the chloroform had gotten in its work.

ANSWERED.—Student: "Professor, one of the class wishes to know if your ears ever smile when your mouth goes by." Professor: "Those parts of my anatomy mentioned not being within easy range of vision, I cannot say; but I have often noticed in the case of this particular student that his mouth, likewise the corresponding holes in the faces of other members of the class, smile when his ears go by."

TIC DOULOUREUX CURED BY ELECTRICITY.—Henri Bordier (*Jour. des Praticiens*) considers electricity the most favorable method of treatment for neuralgia. He uses aluminum or platinated copper electrodes, the galvanic current, 60 to 80 milliamperes for an hour daily, in trigeminal neuralgia. Two case-histories are reported in detail, men of 59 and 69, both cured permanently by galvanism. Bordier considers this treatment invaluable in tic douloureux.

STOMATITIS DUE TO BACILLUS OF VINCENT.—Dr. H. Heiman presented two children suffering from this form of ulcero-membranous stomatitis. The bacillus of Vincent and the spirillum of Muller were found constantly associated with this variety of stomatitis. A smear from the ulceration made on a cover-glass and stained with carbolfuchsin would show the characteristic bacillus. The treatment consisted in the application of a 5 or 10 per cent solution of nitrate of silver, and a mouth wash of permanganate of potassium.—*Med. Record.*

CURIOUS MEDICAL CERTIFICATE.—A man in New York recently made complaint against another man, whom he accused of knocking out several of his teeth. They were both Italians, as was the physician who signed the following certificate, which the complainant handed the judge sitting in the case: "I certify that I had visited Nicola Bonanno, fifty years old, and have found in him severe lesion superficial of the skin in the nose and in the face and echimosis into the same parts also asportation of the incisive tooth and luxation of other two teeth in the inferior dental series, with lesions of the

soft parties of the gum. This lesion is curable complexibly in several days with doubt of the debility into the luxative teeth." The case was adjourned.

HEREDITARY SYPHILIS.—A French writer, Dr. A. Brunet, states that erosion of the first lower molar tooth is a pathognomonic sign of hereditary syphilis. This sign is said to be much more reliable than irregularities in the incisors for the reason that ossification of the first molars occurs at the sixth month of intrauterine life and the erosion is due to a partial interference with normal process of ossification.

BAKERS' TEETH.—A dentist has called attention—says a London weekly journal—to the deplorable condition of the teeth of bakers, and asserts that he is often able to tell the profession of the patients by the condition of their teeth. The decay is soft and rapidly progressive. The principal parts attacked are the outside surfaces of the teeth, commencing at the top of the root and rapidly extending to the grinding surface.

BRITISH DENTAL ASSOCIATION PROSPEROUS.—The treasurer reports that the Association has \$12,500 on hand. The membership is now 1,205. There are only 4,600 registered dentists in England, Ireland and Scotland, and even supposing that the membership list embraces dentists from all three countries, the British Dental Association sets an example for every dental society in this country, both in membership and financial condition.

RECORDS VALUABLE.—A physician in Kansas City recently sued a patient to recover \$489 for medical services, and the patient began a counter suit for \$25,000 damages for malpractice. The physician won the case only because he had kept a daily record while in attendance on the patient, by means of which he was able to prove great care and unusual skill in treatment. This shows the importance of physicians keeping notes of all cases, and the necessity is only a little less for dentists.

N. Y. DENTAL PRACTICE BILL.—There has been introduced in the New York State Legislature a bill providing that no degree in dentistry shall be conferred in this state unless the candidate has satisfactorily completed a three-year course in an institution registered by the regents or has had five years' actual practice in operative and mechanical dentistry subsequent to the registration of his certificate as a student, and passes an examination to the satisfaction of the board of examiners.

DAMAGE SUITS.—A woman in New York sued two dentists and an X-ray operator for \$5,000 damages for injuries resulting from an exposure to the X-ray current. She was a persistent sufferer from neuralgia, and the dentists had X-ray photographs taken of her face to discover the cause. The judge dismissed the suit on the ground that she had no just claim for damages.—A woman in Chicago has sued the Boston Dental Parlors for \$5,000 damages, claiming that the work which she had done there was very unsatisfactory.—A woman in Rochester, N. Y., has sued a dental parlor for \$100 damages, claiming that the operator injured her jaw while extracting a tooth.—A man in San Francisco has sued a firm of "painless dentists" for \$1,500 damages,

claiming that they ruined his teeth by unskillful work.—A woman in Seattle, Wash., has sued her dentist for \$1,000 damages for unskillful work.

ACOINE—A NEW ANESTHETIC.—Acoine is the name of a product destined to rival cocain, morphin, chloral and other anesthetics. A drop upon a gnawing tooth diminishes pain. Its properties were recently reported to the French Academy of Medicine by Dr. Chauvel, based upon experiments. It is claimed that acoine is not toxic.—*Phila. Med. Jour.*

CONFLICTING TALES.—A woman in Paterson, N. J., has caused the arrest of a dentist on the charge that while she was under the influence of an anesthetic given for the extraction of some teeth he kissed her. The dentist says that three other people were in the room all the time, that it took all four of them to hold her, and that while under the influence of the anesthetic she broke up the furniture and tried to throw herself from the window.

ACCIDENTS.—Oct. 23, while a woman was sitting in a dentist's chair, a piece of iron crashed through the window and broke her arm. Investigation showed that workmen were breaking up old iron with dynamite and that this piece had been blown a quarter of a mile.—The vulcanizer of a dentist at Baltimore blew up Nov. 3, and badly injured the dentist. He may lose his eyesight.—The vulcanizer of a dentist at Grand Rapids, Mich., blew up Oct. 8, and wrecked the premises.

AS OTHERS SEE US.—Success to the *DIGEST*, our best dental journal. W. H. Ryland, Lonaconing, Md.—The *DIGEST* becomes more and more interesting and valuable. F. M. Thompson, Detroit.—I consider the *DIGEST* our best dental journal. W. N. Rowell, Lewisville, Tex.—I am much pleased with the sample copy of the *DIGEST*, and think in future I shall take your journal only, as it seems to cover all the ground. Another reason is because it is free from the Combine. E. D. Washington, Wolseley, Can.

SALIVARY CALCULUS.—J. J. D. Bryant showed a salivary stone which he had removed from the submaxillary duct. It weighed twenty grains and was an inch and one-quarter in length, which is about the usual length of the duct in which it was molded. The calculus had bothered the patient for about six months. It had given rise to considerable pain, due to obstruction of the duct.—*Med. Record.*

TO AVOID REPOLISHING AN ENTIRE GOLD PIECE AFTER REPAIRING.—*Zahn-kunst* (quoted in *Archiv fur Zahnheilkunde*) advises the following procedure in cases where repairs have to be made: The plate after being painted with a solution of borax, which is allowed to dry, is invested and soldered. After the soldering, the plate is boiled in a weak solution of sulfuric acid. By this method, it is claimed, only the soldered part will have to be repolished.

ILLEGAL PRACTITIONERS.—Last month a traveling dentist in Iowa was arrested for practicing without a license.—Oct. 24, a dentist at Denver was arrested for failure to have a license.—Nov. 11, a dentist at Victor, Colo., was arrested for being without a license.—Nov. 11, a dentist at St. Louis was arrested for practicing without a license. The Missouri State Board of Medical Examiners expects to begin immediate action again all the illegal practitioners in the state.—Nov. 8, a student at Biddeford, Me., was given three days in

which to decide whether he would leave town or would stand trial for practicing dentistry without being registered.

OVEREATING AND MORALITY.—At a recent purity congress held in Chicago a vegetarian delegate read a curious paper on diet. He stated that much of the immorality in the world was due to the eating of animal food. "The cook," he said, "often leads to more drunkenness and excess than the saloon-keeper. Highly seasoned rich animal foods lead to indigestion and ill-health. Ill-health weakens the will, and a weak will breaks down the moral character. Total depravity is often nothing but total indigestion."

This reasoning reminds one of the old conundrum: "Why is home like a baby?" the answer being: "Because home is where the heart is; the heart is in the chest; the chest is a box, a box is a small shrub, a small shrub is a growing plant, a growing plant is a beautiful thing, a beautiful thing is a primrose, a primrose is a pronounced 'yeller,' and a pronounced 'yeller' is a baby."—*Ex.*

HAS THIS IDEA EVER OCCURRED TO YOU BEFORE?—At a meeting of the American Dental Convention, held in August, 1857, a member, Dr. Leech, made the following observation: If you take a piece of steel and make a slight mark across it with a file, you take from its strength more than you would if you should cut down the whole instrument to that size; for the reason that in applying a bending force to it, the whole effect of the force is expended over the point cut by the file, whereas with a uniform reduction of surface the bending force is distributed over the entire length of the piece of steel. Hence it is important that every instrument should have as polished and smooth a surface as possible, and that the angle should not be too abruptly turned; an angle turned with a perfect corner is not so strong as one that has a slight curve. In forming steel into instruments as true a taper should be carried back to the cutting point into the socket or handle as possible, so that the strain will become gradual all along to the point. If a shoulder is cut down to get a small size the spring is closed at that point and a strain will wrench it off.—*Cosmos.*

INFANTILE PATHOLOGY AT THE PERIOD OF DECIDUOUS DENTITION.—In a paper in the *Lancet*, Dr. W. H. Dolamore makes the following statement: "There are still diverse opinions as to the infantile diseases occurring during dentition—as to whether they are merely coincident phenomena due to the irritation of teething, or whether they themselves are the existing cause of delayed and painful dentition, the diseases interfering with what should be a painless physiological process." [In some cases infantile diseases are the cause of retarded dentition, for, as is well known, disturbed nutrition will retard the development of an organism in proportion to the extent of the interference with the nutritional process. In other cases, however, the constitutional disorders are due to a constant irritation of the highly sensitive pulps of the not fully developed deciduous teeth. Hence it is easy to comprehend the reasons for the prevalence of several opinions on this question and the impossibility of definitely stating whether the diseases from which the infant may be a sufferer at the time of dentition are caused by difficult eruption or *vice versa*. Experience has, however, shown that in a great

majority of cases pathological dentition is the predisposing cause, while in other cases it is the direct cause, of the serious general phenomena with which the dentist who has had an opportunity to treat infants, or the pediatric, is so well acquainted.—*Ed. Cosmos.*

GELATIN AS A HEMOSTATIC.—Zibell (*Munchener med. Woch.*) analyzed four specimens of gelatin and found that the most constant constituent was calcium, the average amount present being 0.6 per cent. In 100 cc. of a 5 per cent solution this would correspond to 0.03 gm. of calcium—a not inconsiderable dose, particularly when it is considered that in this form it is very soluble and therefore very absorbable. The action of calcium salts in hastening coagulation is well known, and in the absence of more definite knowledge it seems highly probable that the gelatin owes its hemostatic properties, when given subcutaneously, to the calcium it contains.—*Med. Times and Hospital Gaz.*

ANKYLOSIS OF TEMPORO-MAXILLARY ARTICULATION.—M. Gindus speaks of this affection as being most rare. It manifests itself generally between the ages of fifteen and twenty years. The ankylosis is generally unilateral, although cases of double ankylosis have been reported. Irreducible dislocations may give rise to this trouble; also fractures of the neck of the condyle, and especially fractures of the walls of the glenoid cavity. Traumatic arthritis may also be the starting point for this trouble. These are only a few of the causes of this serious affection. The prognosis of ankylosis of the jaw is grave, from the fact that it hinders or prevents mastication and renders normal digestion impossible. Nutrition is compromised and serious results follow. Numerous operative proceedings have been proposed by different authorities. The writer concludes that a serious traumatism of the temporo-maxillary articulation occurring at an early age is always followed by bony ankylosis. Ankylosis is favored by the proliferation of a very active periosteum. Surgical treatment is justifiable, the best method being the resection of the condyle, and, if necessary, the resection of the coronoid apophysis. The success of the result is proportional to the size of the piece of bone which is removed.—*Rev. Méd. de la Suisse Romande.*

ETHER NARCOSIS.—Paul Campiche concludes that: (1) Ether is a specific irritant of the lungs and bronchi, and consequently is absolutely contraindicated in all patients whose respiratory apparatus is in bad condition; (2) Even when taking cognizance of the contraindications to ether, and although the technique be as perfect as possible, the point of entire suppression of ether pneumonia has not yet been reached; (3) A certain number of accidents are inevitable, and in the use of chloroform they are undeniably more frequent than in ether narcosis; (4) The rôle of the responsibility of narcosis for pulmonary complications has been greatly exaggerated; (5) A general defective state (bad for the heart in ether, and bad for the bronchi in chloroform) is responsible for many untoward results in narcosis; (6) But in the great majority of patients there are no accidents, unless the operation is particularly favorable to pulmonary complications, viz., operations for hernia, for goiter and laparotomies; (7) Ether, being less dangerous

than chloroform as regards the remote consequences of narcosis (bronchitis and pneumonia), ought to be, excepting its contraindications, adopted as the anesthetic of choice on account of its great advantages over chloroform, chief among which is its harmless effect on the heart and the circulation.—*Rev. Med. de la Suisse Romande.*

INSANITY AMONG WOMEN.—Professor Zimmer of Berlin has been investigating the causes, and has come to the conclusion that if women are admitted into competition with men the inevitable result will be a tremendous increase of insanity among the women. He finds that the percentage of women teachers who become insane is almost double that of the men teachers. Inquiries were also made about women employed as telegraphers, sales clerks, and in the telephone service, and, furthermore, with regard to women engaged in the Swiss watchmaking trade. These inquiries showed that in the occupations mentioned a far larger proportion of women than men succumb to mental disorders.—*Med. Times.*

BONE FILLING WITH AMALGAM.—J. H. Barbat reports the case of a man with an ulcer of the leg contracted in the tropics, and which led through a fistula to the diseased tibia. The diseased portion of the bone was exposed and removed, and the cavity was filled with ordinary copper amalgam until the whole surface was covered, leaving a hole, which was partly filled with dental cement, the top being covered with more amalgam. The skin was sewed over the filling and dressings were applied. The wound healed except at the upper angle, with relief to all symptoms. The small opening at the upper angle refused to close, and probing revealed the fact that some of the bone had broken down. The amalgam was removed, and the bone was found in good condition, except at the upper end, which was curetted and the cavity filled with formalin gelatin. This was in turn removed, leaving a large cavity covered with a healthy surface. In time the skin grew down into the cavity, and complete healing finally ensued.—*Occidental Medical Times.*

NEW LOCAL ANESTHETIC.—*The Lancet* in a recent number writes of a new local anesthetic procured from a plant named "gasu-basu," a native of India, the active principle of which is an alkaloid. The English journal says that experiments were made with a salt obtained by treating the alkaloid with hydrochloric acid. The salt has been named nervocidin. In weak solutions it produced a marked local anesthesia of the cornea of warm-blooded animals. Two drops of 1-20 per cent solution applied to the human conjunctiva produced a burning sensation, accompanied by lachrymation, and followed, after twenty minutes, by anesthesia of the cornea, lasting for five hours. After seven hours the cornea regained its normal condition. A 1-10 per cent solution of nervocidin brushed over the mucous membrane of the cheek caused local anesthesia of the brushed surface, and of the tongue, accompanied by loss of the sensation of taste and the perception of touch, but without loss of the perception of heat and cold. Subcutaneous injections of the drug have not, as yet, been successful in producing local anesthesia in animals. The general action of nervocidin on the system was that

of a toxic which, by paralyzing the motor centers of the nervous system and of the peripheric nerves, caused death. All the experiments up to the present undertaken proved that nervocidin was a powerful local anesthetic possessing a great advantage over cocain, in that it produced a much more sustained action, for the effect of a $\frac{1}{2}$ or 1-5 per cent solution might last for two or three days. The new anesthetic, however, has its drawbacks, such as the local irritation to which it gives rise, the slow production of a state of anesthesia (from ten to twenty minutes being required), and a liability to cause nausea, vomiting, salivation and other symptoms of general poisoning.—*Med. Record.*

RESECTION OF SUPERIOR MAXILLA.—Dr. William E. Casselberry showed a case in which a unilateral resection of the superior maxilla had been made on account of intranasal fibro-sarcoma, presenting the patient chiefly to demonstrate the degree of deformity resulting. The incision was made from below the orbit around the nose and through the lip, the flap dissected back, and the left maxilla, including the teeth, removed. The man's cheek, however, still has a reasonable prominence. Union has failed along the line of the cleft in the hard palate, so that the patient practically now has an acquired cleft palate. The situation of the growth and a shadow on transillumination led me to think the antrum was involved, and this was one reason why resection of the superior maxillary bone was decided on. When we came to shell the growth out, it was disclosed that the antrum was not directly involved, but I am still of the opinion that the operation was justified by the appearance and character of the growth, but more so on the supposition that the antrum was involved. Had I been able to determine that the maxillary sinus was not affected, I would have advised a less extensive operation. There is, as yet, no definite evidence of recurrence, although the tissue which has partly filled in the space of the cheek bone does not look entirely natural.

Another hazard of the operation concerns the necessity of ligating the common carotid, or at least the external carotid artery, in order to control hemorrhage. Following the operation, this patient became paralyzed on the right side, and the paralysis has persisted somewhat, but it is gradually becoming less. Inasmuch as the line of ligature of the external carotid is very close to the common carotid, the paralysis might have occurred from a clot going through the common carotid as an embolus.—*Jour. A. M. A.*

COCAIN AND EUCAIN.—By George W. Crile.—Mention is made that cocain or eucain when injected into a nerve trunk produces a "block" or a condition of the nerve which prevents the passage of afferent or efferent impulses. The conductivity is as completely interrupted as if the nerve were divided. This "physiological block" may also be produced when one of the above named substances is injected underneath the nerve sheath. The effect of cocain or eucain upon the nerve structures—rest of functional activity—is the same. The general action of cocain and eucain is also practically identical. Injection of cocain into the venous system is followed by a temporary increase in the blood pressure. In toxic doses the blood pressure rapidly sinks. The author carefully details the effects of cocain when injected into the spinal cord or into the subarachnoid space. He then cites the clinical application

of the experimental evidence, noting the effect of an injection of cocain into the nerve trunks for operations on the extremities; for amputations of the leg; amputations at the shoulder joint, and laryngotomy. The histories of a number of cases are included in his article. The following clinical summary is drawn: "In the clinical use of cocain and eucain particular attention is called to a most important feature, viz., that shock is almost wholly avoided, because all afferent impulses are blocked. It is not known that afferent impulses set up by injury or operation are the cause of shock. These impulses are but slightly modified by general anesthesia. The afferent impulse, constituting pain, is abolished by general anesthesia, but those affecting the vasometer, the respiratory and the cardiac mechanisms are not controlled; but cocain or eucain absolutely blocks their passage, making a physiologic amputation of the part. These anesthetics wholly prevent reflex inhibition, but the principal causes of collapse in certain operations and injuries, e. g., operation on the larynx and pharynx. Given hypodermically, the experimental evidence shows that they diminish shock in operation on the splanchnic area and absolutely alter this area in the processes of operation or exposure, as abundantly proved by the series of double experiments. I have had but two opportunities of testing this clinically, both in operations for gunshot wounds of the intestines, and in each experimental evidence seemed to be corroborated.—*Jour. A. M. A.*

THE DOCTOR WOMAN.

I ONCE was sick. Oh, heavens, how I ached!
My eyeballs bloodshot in their sockets rolled;
My skin was dry, my mouth and throat were baked.
While up and down my back ran streaks of cold.

Sometimes a cramp would bend me like a bow,
And then I'd stretch like Goodyear's gum elastic,
When suddenly a pain from depths below
Would shoot across the region epigastric.

And add to this—oh, sad it is to tell!—
I had no wife, no servant near me;
Was stopping at a very poor hotel,
And tried in vain to make the waiters hear me.

I thought at length that I must surely die,
So seized a bootjack, lying on the floor,
And with the little strength I had, let fly
That useful implement against the door.

A female Dutch domestic in the hall
Was roused at last by this tremendous clatter,
And angrily responded to my call
With "Vell, now, mishter, vot ish all de matter?"

"Matter!" I cried, my patience lost entire,
"I'm sick and dying; if you are but human,
Send for a doctor, or I shall expire!
Oh, for a doctor! Quick! A doctor, woman!"

"Yah!" roared she out, "a Doctor Voman. Vell,
I sends you von right off!" Away she sped.
But what my feelings were I dare not tell,
As I sat shaking in my lonely bed.

Then came a tread of feet along the floor,
And, with a voice quite loud enough for two men,
That Dutch domestic opened wide the door,
And, grinning, shouted, "Here's de Doctor Voman!"

And there she stood, a picture; rosy cheeks,
A blue, clear eye, whose depths were almost killing;
Her lips were rubies, pouting when she speaks,
With pearls of teeth without a speck of filling.

She took a chair and sat beside my bed,
And placed her tiny hand upon my brow;
And as she softly smoothed my aching head,
She sweetly whispered, "Are you better now?"

"I—I—I really think I do feel better."
(She was so graceful, modest, fair and young,
And asked so very sweetly if I'd let her
Look for a moment at my horrid tongue.)

"How is your heart," she asked, "that fount of life?
Does palpitation ever break your rest?"
And then (this part I never told my wife)
She laid her head, to listen, on my breast.

Forthwith the fever left me, and a thrill
Of life and health went bounding thro' my veins;
I never took—I kept—the little pill
She left as sure specific for my pains.

And when I told my wife how sick I'd been,
The story of my suffering greatly shocked her;
I told her 'bout my pains, my aches, the inn,
But did not mention much about the doctor.

—DR. W. T. HELMUTH in *Maryland Med. Jour.*

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Original Contributions.

THIRD MOLARS.

BY C. N. PEIRCE, D.D.S., PHILADELPHIA. READ BEFORE THE NATIONAL DENTAL ASSOCIATION, AT NIAGARA FALLS, JULY 28-31, 1902.

It is well known that in all animal life there are differences, that characters themselves are inconstant, that they may or may not appear in individuals of a species, and that under such circumstances these differences are not evidences of a break in the line of descent. In one genus we may have two tubercular molars in the inferior series, while in an allied genus three such teeth may exist, or in another but one. These conditions, when recognized, excite interest and comment, but the cause is not always apparent.

The normal dentition of man is, on each side: incisors, 2; cuspid, 1; bicuspid, 2; molars, 3; yet it is not uncommon to find in the higher races individuals who have only two molars, in one or both jaws, or if three are present, the third or posterior one is evidently a degenerate in every particular. From the frequency of this occurrence the usual estimate of the third molar is that it is variable in size, structure, durability, position and time of eruption. It is the purpose of this short paper to throw some light if possible upon the variability of this tooth, and to see if any cause can be assigned for this difference in size, structure, position, etc. While the lower third molar is the most typical in its character, yet the similarity with regard to their erratic condition is such that both the upper and lower should be classed together.

In the examination of the crania of the animals supposed to be next lower than Man, such as the Gorilla, Orang and Chimpanzee, of which many papers have been written, the third molar is with slight exception as large as the first and second, and in some cases a trifle larger, having abundance of room posterior to it, or between its distal surface and the ramus, in the lower jaw, to give free and unlimited use in the function of mastication. In addition to this, the

number and size of cusps, and the number, position and size of roots or fangs, correspond in every way with the teeth just anterior to them, the cusps especially being arranged according to the typical pattern.

In the lowest races of mankind the third molar is usually of large size, well formed, of dense structure, and seldom misplaced. In the examination of crania belonging to the native-born African we are certainly in touch with the least developed of the human family, and where it is fair to assume the food is coarse and uncooked, requiring powerful muscles and dense teeth for its mastication. Of these people we had one hundred and fifty crania under examination, and in these there were four hundred third molars in position. Three hundred and seventy-five of these were as large and well shaped as the molars anterior to them, twenty-four were smaller, and one was a small peg-shaped tooth.

On the examination of fifty crania of the Eskimos we were in contact with a people of whom the name would imply lived largely on raw flesh, it being their custom to consume fish and game in this manner. Their home has been Greenland, the Aleutian islands and Alaska. In these fifty crania were found one hundred and fifty third molars in place, one hundred and thirty of full size and like the first and second, save four had wrinkled masticating surfaces, such as are found in the Orang, twenty were smaller in size, with the cusps well defined.

The Chippeway Indians were in close contact, in location to the Eskimos, occupying the Southern part of Labrador, shores of Hudson Bay, and the lakes of Michigan and Superior. From their close contact with the Eskimos they partook much of their habits of life, and especially so in their food. It is not therefore surprising that we should find in them a close resemblance to their neighbors in tooth development. On the examination of twenty crania, sixty third molars were in place, fifty-two of these were large and well formed, not inferior to the anterior molars, while eight were smaller in size, some of them being much wrinkled on the masticating surface.

The Sandwich Islanders, or natives of the Hawaiian Islands, have lived upon pork and fish, both dried and fresh, also consuming a variety of fruit growing upon the Island in great profusion. On examining sixty-five of the crania of these natives, two hundred and thirty third molars were found in place, two hundred and ten

of these were large and well formed, while twenty were smaller than the first and second molars.

From the eastern portion of Siberia we have the peninsula of Kamchatka. This country is inhabited by a strong, hardy people, capable of any amount of toil and hardships and thoroughly inured to the severities of the climate. Eighty crania were examined, these had two hundred and sixty third molars in place, two hundred and twenty of them were of full size and density, while forty were smaller in size with imperfections in shape.

The Malay Peninsula is the most southern point of Asia. The natives are in a low state of culture, living entirely by the chase, pursuing the game with poisoned arrows. Eighteen crania were all to which we had access. These had thirty third molars in place, of which twenty-five were full size compared with the first and second, while five were smaller.

Notwithstanding the large population of India and the thousands that annually die, the collection of crania accessible is very small. The diet of the natives is largely vegetable, rice forming an important staple. The twenty crania examined furnished only thirty third molars in position, fifteen of these were large, and a like number smaller than the molars anterior to them.

The crania of the Egyptians were limited to twenty-five for examination. These had only fifty third molars in place; twenty-five of these were large and twenty-five small. Their diet, like the people of India, was largely vegetable.

The natives of Sweden, like the people of India and the Egyptians, divided the large and smaller third molars equally between them, there being only eleven in place in this small number of crania, five of these were large and six small.

Of the Peruvians we had only ten crania for examination. Thirty third molars were in place, ten of these were as large as the first and second molars, while twenty were smaller. This result was not surprising, as these people lived almost exclusively on cooked vegetable diet and fruit.

In the foregoing statement regarding the condition of the third molars in ten distinct varieties of the human family the writer is well aware that the number cited is meager, but great were the surprise and disappointment to find the molar in question so frequently lost or absent from the jaw examined. The bones in the cases neces-

sarily become dry, so that individual teeth drop out, and the third molars, where the crown and roots are reduced in size, are more liable to this displacement than any of the other teeth, hence the deficiency was in the locality that produced the greatest discrepancy in the examination.

As meager as the foregoing illustrations are, they give us a slight insight into the conditions under which we should expect to find a well-developed third molar, and without assigning any cause they indicate the nationalities where degeneracy of this tooth has certainly made perceptible progress. By adding the testimony of prominent and well-known observers it will be readily seen that modern life and higher civilization have decreased to a marked degree not only the size but the structure and general characteristics of this tooth, even to its complete absence in some families and its partial disappearance in many.

Dr. A. H. Thompson says: "In the lowest races of mankind the wisdom tooth is of large size and is seldom misplaced. It grows smaller as we ascend the scale of civilization."

Charles Tomes says: "In the lower races the wisdom tooth has ample space to range with the other molars. It is a fully developed upper or lower molar and has the characteristic pattern, that is, quadricuspid if above and quinquicuspid if below, and the roots are like the corresponding molars."

Darwin says: "In civilized man the degraded condition of this tooth in its degeneracy and imperfection is very great, as compared with the nearly perfect condition of the same organ in the lower primates. Still more marked differences are found between the savage and civilized races than between the savage races and animals."

Prof. Schaaffhausen accounts for "this difference between the races by the posterior dental portion of the jaw being always shortened in those that are civilized, and this shortening may be attributed to civilized man habitually feeding on soft, cooked food, thus abridging the use of his jaws. Of seven hundred and sixty-three persons over twenty-six years of age three hundred and forty-two were males and four hundred and twenty-one were females; forty-two per cent of the males and thirty-eight per cent of the females possessed no third molars." He states further that as there is no space between the second molar and the angle of the jaw after the twenty-sixth year,

this is proof that nature has made no provision for the eruption of the third molar.

Prof. Wortman says: "In the white man the shortening of the face and consequent reduction of the facial skeleton have materially affected the dental arch. To such an extent is this true that it is almost the exception nowadays to find a perfectly well formed arch with a normal set of teeth. The teeth that have been most affected by this change are the last molars, which may be truly said to be in an advanced state of disappearance, and at no very distant period the European skull will be characterized by the absence of the third molar. When it is developed it is always smaller than the other molars, the roots are connate or grown together, and it is so lacking in vitality as to be subject to rapid decay, frequently necessitating early removal."

Dr. Daniel G. Brinton says: "In nearly all the black people the wisdom teeth are generally furnished with three fangs and are sound, while among the whites they have only two fangs and decay early. Most ancient jaws exhumed in Europe present the former character."

Richard Owen says: "The wisdom tooth is sometimes not developed."

With fifty years of professional work the writer has had several very serious experiences resulting from the impaction of the third molar. These of course have been where nature has failed to provide room for its eruption, and also where artificial assistance was not given in time by the removal of the second molar, to anticipate the impaction and the necessary inflammatory condition with its unfortunate concomitants. In addition to these experiences of sickness and suffering, where in some cases life was endangered, observation has taught that more than seventy-five per cent of these teeth have been less in size than the first and second molars. All of these have had not more than four cusps and often only three, especially those in the upper jaw, where the roots were invariably conoid and curved posteriorly. While the crowns have in the majority of cases been quadrangular in shape, frequently those have been found that were irregular and almost without form. The masticating surface of the inferior tooth has often been found wrinkled to such an extent that it would indicate a reversion to the Orang, where that character is so prevalent.

The buccal and distal surfaces of this molar are usually more con-

vex than the same surfaces of the first and second molars, while their mesial and lingual surfaces are very similar. This difference in size and conformation is not the only divergence from the teeth anterior to them. Their variability in structure, time of eruption and durability are evidences of degeneracy and of the marked tendency to ultimate elimination.

Another diversion from what may be termed the normal denture is the presence of the fourth molar, always occurring in the upper jaw. Only three times has this been observed by the writer; once where it was on either side of the mouth and twice on one side only. The additional tooth was between the second and third molar and in general appearance resembled the second molar. Of these fourth molars Dr. Thompson quotes from Mr. Mummery, who reports nine cases found on the examination of three hundred and twenty-eight West Africans. We have in the Morton Collection, Academy of Natural Sciences, Philadelphia, an Australian skull with thirty-five teeth. These subjects with additional teeth may all be considered reversions to a primitive condition.

In considering the foregoing statements, is it possible to attribute the predominance of the prognathous jaw and its correspondence with the large third molars entirely to absence of culture and the food habit, and not at the same time extend these influences to the shortened maxillary with smaller and crowded molars and the deficiency of teeth? The latter condition certainly belongs to civilized life. The pertinent inquiry which interests us all is, what are the important factors in producing the result?

With civilized life and higher education we have an exalted sensibility of the nervous system, a larger brain case, an enlarged brain. Are these factors, or is it the concomitant of these, such as cooked and less coarse food, with accompanying conditions, which entail less force in mastication, hence less muscular energy, and teeth less in density and less in size? Again, is the size, the stature of the individual, of consequence in estimating the size and structure of the teeth? While the influence of use and disuse have been considered important factors in tooth development by the writer, yet other elements have doubtless played their part in the modification of these structures, so that one needs to be guarded in making dogmatic statements. It is not possible in a few hours' study annually to solve these natural phenomena, so the best we can do is to watch and wait.

Discussion. *Dr. J. Y. Crawford*, Nashville: The main point of emphasis in this admirable paper is the influence which the withdrawal of functional activity has upon the development of tooth structure. The same laws that influence the modification of these teeth, the changing of their physical formation, and their obliteration, must be reckoned with as factors in the production of the diseases and the decay of the teeth. We forget that environment and withdrawal of functional activities not only tend to obliterate the third molar, but exert an influence upon the last of the three series of teeth in the mouth. The absence of the second bicuspid may often be traced to the same influences that worked upon the third molar.

This paper emphasizes the fact that a study of the question sustains the belief that the change of climate, mixing of races and withdrawal of proper functional activity are much more conspicuous factors in the destructive processes of the teeth than we supposed. I was once discussing a paper along this line before the Virginia State Dental Society, and after the session an old Virginia dentist remarked to me, that when the planters in slavery days came back from a trip North they would not let negroes wait upon them at table who did not have good teeth, but no matter how good their teeth might be when they were taken out of the fields and put in the house, "a regime of white folks' soft food soon made their teeth decay. Now since the war the negroes are becoming more civilized, and their teeth are decaying just like those of white folks." I replied that he should have made those remarks on the floor and saved me the trouble of a long explanation about "the withdrawal of functional activity." The teeth are tissues of the human organism and respond to all the laws which govern other tissues, although perhaps in a less marked degree. The withdrawal of functional activity not only tends to obliterate the third molar, but it makes the other teeth more susceptible to disease.

Dr. A. H. Thompson, Topeka, Kan.: It is a singular fact, as Dr. Peirce has stated, that in the lower races which are poorly developed mentally but well developed physically these teeth still maintain a considerable functional activity. This is especially true in the negro race. My attention was called to this in examining some beautiful specimens of skulls of the people of the Florida Keys, found in the shell mounds, in which the savage characteristics are greatly exaggerated, and these teeth are beautifully formed and quite as complete

as the other molars in the same series, so that they approach the ape-like form. Yet this degeneracy of third molars, as was remarked by Dr. Peirce, extends back to some of the quadrumina and is found in the Chimpanzee. In the very lowest human races, such as the Bushmen of Australia, and among prehistoric peoples, there is in all a tendency to reduction of the third molar, so we see that it begins very far back. As we advance in the scale of development and civilization these teeth are much reduced, a large number of them absent, and others impacted and productive of disease. This is true of all civilized peoples, both ancient and modern. I noticed this especially in my study of the Peruvians, who were highly civilized in their way, and among them were found as many degenerate third molars as among Europeans.

Dr. J. Taft, Ann Arbor, Mich.: I am not in sympathy with the idea that the human third molar is undergoing a process of suppression. No doubt it is somewhat impaired, but that is probably due to a lack of proper use, a want of normal activity, as a result of which the jaws and the teeth are not developed as they once were or as they would now be under different circumstances. We have all often observed that people who thoroughly masticate their food have better teeth than those who do not, and it is necessary for the proper growth and development of the teeth that they have exercise. Any organ would deteriorate if not used as nature intended. If during the development of the teeth they were used as they should be, and as other peoples have used them, they would be just as perfect to-day as they were in the earlier periods of the race. I do not believe that the teeth are necessarily undergoing a process of deterioration. It is not necessary for us to return to barbarism or to the habits of life of earlier races, as it should be a simple matter to educate our patients and their children to use their teeth as nature intended. When this is done the third molar will equal the others and the rest of the teeth will not be so subject to decay.

Dr. J. D. Patterson, Kansas City: I have been much interested in the paper and discussion, but I do not bemoan the disappearance of the third molars as some others seem to. If we could get rid of all of them it would save us an immense amount of trouble, and I wish Dr. Thompson and others would hasten their disappearance, so that impacted third molars and the conservation of erupted ones would not burden the later years of our practice as they are now doing.

Dr. James Truman, Philadelphia: Dr. Peirce has spent three years in working up the matter for this paper, and he is to be congratulated upon the result. I know the third molar has been a troublesome tooth to every practitioner, but in the earlier races it was quite a different molar from that of civilization. As peoples develop the jaw begins to recede and contract. I cannot agree with Dr. Taft's statement that this contraction is due to variations of food. These teeth are all developed in what is known as the follicular stage, and it is then that the contraction probably takes place, and as the jaw recedes backward these teeth suffer more or less compression and gradually develop smaller bodies. The idea that this development can be produced after the enamel is formed is contrary to all recognized theories of comparative anatomy and general histology. As to the third molar being lost, it may be crowded out of its proper place, but I doubt very much if it will ever be absolutely lost. This same condition of small third molars is found in civilized races thousands of years before the Christian era, and I don't think there has been any practical change in these teeth within the development of the present civilization.

Dr. Peirce, closing discussion: I commenced this examination of third molars with the belief that use and disuse modified structures, but I found it probable that other factors were at work. The fact that the third molar is better developed and more efficient in uncivilized than in civilized life is certainly strong evidence that a modification of diet has had its influence in the development of the tooth. When we find that savage people, who live largely by the chase and on raw and coarse food, have a better third molar than others higher in the scale of civilization, we cannot but infer that diet has influenced the tooth. In talking recently with a prominent scientist I asked his opinion regarding the influence of use and disuse. He replied, "I am entirely ignorant. For many years I believed that these were factors, but to-day I do not know." I must take the same stand. Statistics show that at least seventy-five per cent of the third molars of civilized people of to-day are reduced in size, and we must look for some reason. While I may still adhere to the view that use and disuse do modify structures, I am quite convinced that other factors with which we are not familiar also play an important part in the reduction of this tooth as well as of other tissues.

A BIRD'S-EYE VIEW OF PATHOLOGY.

BY D. R. STUBBLEFIELD, D.D.S., NASHVILLE, TENN. READ BEFORE THE
NATIONAL DENTAL ASSOCIATION, AT NIAGARA FALLS, JULY
28-31, 1902.

When the request for a "touch of your quality on Pathology" was first received it temporarily blinded me to the responsibility of its acceptance, but when the acceptance had burned the bridges behind me the pleasure died out and the responsibility seemed to take on new life. The conviction, however, that the whole must forever be greater than any part, though at the same time necessarily restricted to the sum of the parts, gave me the courage to hope that a contribution might fill some place without which even this annual session would not be complete. The professionally patriotic duty is upon every member to respond to the call of the sponsors for each section of this great national body and to do his best to meet the demand made upon him. Another reason for the faith that's in me is found in the statement contained in a letter received recently from the president of a state association. It is, "I select the other subject because I believe a paper on Pathology is usually one fool trying to teach a lot of other fools what he doesn't know himself and what they can never hope to understand." If such a sentiment can honestly exist in the mind of a typical member of the profession, there should be no apology necessary for any attempt to render more simple what is so fundamental to our everyday work. In articles, as in life, it is not what you do but how you do it that differentiates the man from the fellow. There is no subject so abstruse that its fundamental principles may not be stated so tersely that they can be comprehended easily. My hope is to thus simply and clearly present the essential principles of Pathology.

Pathology is the study of diseased or perverted functions, as distinguished from Physiology, which considers healthy or normal functions. This change from the healthy function is an effect, and, like all other effects, must have a cause. The ascertaining of the cause or causes constitutes the central idea in all diagnostic efforts, and their removal, followed by the restoration from structural or functional disturbances, is the object aimed at in all therapeutic endeavors. "Remove the cause" is not only the first law of Surgery, but the watchword of reformation in all realms—physical, mental and

even moral—in which we live and have our being. In the treatment of disease it is the golden text, and should be the beginning, the continuance and the end of instruction.

The *causes* of pathological conditions are very naturally divided into two classes, those from *within* and those from *without* the organism. In point of frequency, as in ease of comprehension, those from the outside are the most prominent. They are “unsanitary surroundings,” “outside interferences” and all causes which are not born of and inside the organism. This of course includes all types of microorganisms, which, while proliferating within the organism, are not born of it and are foreign inhabitants therein.

The other class comprises a more obscure and oftentimes intangible source of disturbance, generally brought within the term malnutrition, or those influences that pervert the course of nature and bring deformity. This second class constitutes the special field for the enterprising theorist, the “green pastures and still waters” of the visionary etiologist, and yet remains the great terra incognita of the medical philosopher and scientist of the present and future. With all that modern extension of observation into the very *ultima Thule* of cell-life has attained, and with all the focalization of interested human agency in the possession of this key to the situation, the best conclusions regarding the nature of this class of causes are but gropings in the dark. Intangible causes of perverted nutrition, acting in the obscure land of material formative possibility, have as yet evaded the keenest, most interested scrutiny of modern, Argus-eyed science. We know the results, the effects, but must still *speculate* as to the *what*, the *how*, and even the *wherefore*. In this field it is possible that he knows the most whose imagination rises upon tireless pinions and whose scientific gaze does not blink in the face of the sun.

In the second class we know more. “Unsanitary surroundings,” as a cause of pathological conditions, are not absolutely defined. Broadly stated, we think we know what is meant by surroundings that produce disease, but when we see that what is one man’s poison is the other man’s meat, our certainty grows less certain. Nevertheless, we accept such when generally stated as one of the understood causes of pathological conditions. “Outside interferences” are plainer still. We can readily accept this class and are not doubtful in placing it as certain causes easily understood. Lesions,

wounds of all kinds, poisons—local and general, these and their thousand and one modifications are accepted and known by all men. With equal certainty, and yet with less definiteness of limitation, do we also accept and understand microorganisms as causes of pathological conditions. It is not necessary here to attempt any classification, however brief, but it will be sufficient to say that some microorganisms are disease-producing and others are not. We shall not attempt to separate these two general classes, for our purpose is to indicate, not exhaust, and we feel we can rest secure upon the above general statement in the presence of such a body as this.

But what are these microorganisms? We know, though the world at large does not, that they are members of the vegetable kingdom just as definitely as are trees, flowers, cereals and all those forms of plant life with which the world is familiar. The fact that they are microscopically small, and uncountably numerous, and marvelously capable of reproduction, and constantly present in air and earth and all organic tissue, has given to them the suggestion of mysterious powers of activity far beyond the appreciation of the ordinary mind. It comes almost in the nature of a shock to declare that they are dependent upon their environing conditions, and are as much limited in growth and development by the presence or absence of favorable surroundings as the fragrant pets of the greenhouse or the wholesome friends of the kitchen-garden. No one wondered when it was found that the wheat in the dark, dry, cool chambers of the Pyramid had failed to germinate, and only a few marveled when heat, light, moisture and earthly food caused the latent powers of development to produce the blade, the stalk and the ear, but when this clear process is applied to those minute plants called germs the analogy passes into the incomprehensible. The attending mysteries of only microscopical observation, and only laboratory study, and the general, awe-inspiring responsibility of being the cause of the ills that flesh is heir to, have confused the minds of the masses and they refuse to accept such a simple and everyday analogy.

It is not hard to believe that heat and moisture and food of a proper kind are essential to organic life, but the mind seems to "go up into the air" when asked to apply such familiar necessities to viewless creatures invested with powers so potent when in action. We accept the statements with equal minds from the biologist and agricultural chemist that animals and plants alike depend upon the

supply of food and the favorable circumstances otherwise, but we shake our heads with ill-concealed doubting when such common sense is applied to microbes. We recognize the necessity of organic disintegration and ultimate solution of the food products for the sustenance of our own bodies, and yet we wonder why fermentation is an essential to the well-being of microscopic organic life. With this analogical key we may unlock many mysteries. Sanitation, state medicine, may be summarized as an effort to produce a famine in the land of the micro-entities. Health-seeking in dry altitudes is the encouragement of High License among the Bacilli, thereby limiting their power. Germicides, antiseptics and disinfectants are only the minions of Pharoah Scientificus seeking the death of the first born from the palace to the hovel.

Said the microbe to the germlet as they paused to get their breath,
In the giddy dance of being—proliferation—death,

“Have you heard the latest mandate that high Jove’s put on the rig,
Since he’s quit the lightning business and is resting on his dig?

Well, I’ll tell you, it’s a corker, just the thing we mites have needed
Since the earth and all its fullness to our special use was deeded—
‘Change shall be the law unchanging from Creation’s dawn to end,
Shown in ceaseless recreation from the wholes that ferments rend.’”

Now, then, we have seen that Pathology deals with perverted Physiology, and that every taking care of sick folks or sick things in our lives was being occupied in that realm. It is no unknowable world, although it may be unknown, and it is just as familiar in varying degree as the thousand and one ailments of life with which all must deal. We have seen that the causes of these pathological conditions when reduced to the simplest analysis are from two sources, outside and inside the organism. Looking a little further, we have seen that outside interferences and surroundings, lesions of all kinds, and microorganisms, which, while they inhabit are foreign to the human organism, constitute the causes outside; and that malnutrition or interferences of a less tangible form with the course of tissue-building and tissue-waste in the physiological activities of the organs make up the inside causes. We have seen that “unsanitary surroundings” are such a variable cause of pathological changes that while they are commonly accepted as an easily understood cause, they really afford grounds for much more discussion and investigation before the truth will be certainly known. Lesions, chemical

and traumatic, appeal so directly to the senses that we feel they are understood. Microorganisms, or those organized ferments from a vegetable source that cause pathological changes by the liberation of by-products, are not so well understood, but still are less of a mystery than a few years ago.

These are the causes that produce the effect called disease. The simplest possible paraphrasing of that effect is Inflammation. All those causes produce a series of structural changes called inflammation, which exhibits a protean multiplicity of variation because the simple process is modified by the structure, or environment; or the degree of resistance of the *vis medicatrix naturæ*. If we get a clear grasp upon the simplest form of inflammation, understand its nature from inception to termination, and hold this definitely before our mind's eye, we can see the simple analogy growing more complex by easy stages that do not befuddle the mind. It is not always an easy thing to ascertain the cause, for irritation, shock, the vague and reflex beyond the ken of the most astute, give cause to a series of effects far out of proportion, as far as we may judge. Indeed, there is something quite uncanny in seeing living tissue pervaded all the time—we must admit—by the possible causes of pathological conditions; and yet, day after day, even year after year, it is not upset by their presence, until all of a sudden the power to resist is lost and disease sets in just because there has been some modification of our Heaven-given tendency to get well and stay so. In the twinkling of an eye the kiss of a zephyr has lowered the resistance of our system, and the tell-tale sneeze announces the first, inconsequential step in a series that may end in death. The little "taking cold" is nothing, but if it is assisted by a still greater disturbance of the system's equipoise, coincidental merely, with its more pronounced lowering of vitality or lessening of the resistance to morbid influences, it may bring the organism within the baleful reach of the tubercle bacillus, which has up to then been vainly seeking food for his development.

In just such a vague and unexpected manner do we find inflammation of a most serious nature breaking the bonds that have been holding it in abeyance. It must be so, since no epidemic was ever universal, some individuals managing always to keep the immunity of molecular resistance to possible causes of disease present in their bodies. Inflammation in the early stage is nature's great rally to

expel an intruder. No man knows of how many victorious repulses, or how many hairbreadth escapes possibly, he has been the ignorant and unappreciative recipient. Nature's sentinels have been on guard and her hosts have slept on their arms ever since we came squalling onto the battle-ground of life, and until life's fitful fever is over we may confidently rely upon that great recuperative power implanted within us and within all living organisms, whether vegetable or animal. If inflammation in the early stage is the rally of nature, the symptoms which always attend it are the signs of the losing fight which she is waging, that may be in part a defeat yet on the whole a victory, and we may always tell the stage of the series by reading the signs of symptoms.

The blood is the great first relief to the wounded upon which nature relies. Too much blood is an embarrassment of riches, and congestions become extensions of the trouble which they were created to relieve. Should nature be able to stem the tide of affairs, to remove the cause and hurry on the current of blood that has already begun to show a tendency to lag, and pass it on through the proper channels and into the far reaches of the capillary ramifications, then we have resolution, a resumption of function, and a re-establishment of Physiology. If, on the other hand, nature finds herself unable to cope with the persistent results of irritation, and the accumulation of well-meant blood, she gets to work to limit and circumscribe the effects. A wall is built up around the area and the fight to keep destruction inside the smallest possible space is begun.

This is nature's plan, and all efforts to cooperate should be exhibited with a clear comprehension of the end aimed at and the reparative efforts put forth. The terminations of inflammation are only the best compromises she can make under the circumstances. We may intelligently assist or we may blindly antagonize should our interferences be made without judgment. But why make the story longer? The mind can readily grasp the scheme entire and see the steps to be taken for cooperation, see the possible antagonisms which might arise to thwart, and see the ends aimed at from a judicious interpretation of all the signs and signals. The wonderful diversity of nature in form and feature gives us the unquestioned probability of myriad modifications. Therefore, the question of treatment must forever remain the burden of the hour, for a host of possibilities spring up at the very mention of pathological derangement. No

man can ever hope to lift this burden from the shoulders of the man, and if any man can bear into the quiet chamber of his own soul the consciousness of having done his best at all times he should deem himself the most fortunate of mankind.

Discussion. *Dr. W. C. Barrett*, Buffalo: I can remember the time in the history of this Association when the presentation of a paper on pure pathology would have found but few to debate it, and when the treatment of a subject from a pathological standpoint would have emptied the house in a few moments. Nowadays, however, pathology receives more attention from this body than any other one subject, which is a marked advance.

This paper considers the change from the physiological—the normal, to the pathological—the abnormal, and as the essayist has stated, there are three methods by which this may be brought about: First, by unsanitary surroundings; second, by perverted or malnutrition, and third, by external influences. I am glad that he has given us such a broad basis upon which the subject can be considered, because all side issues are eliminated, and the thought is concentrated upon three distinct points. This is an excellent classification.

Dr. James Truman, Philadelphia: This paper is one of the ablest definitions of pathological conditions that I have heard for a long time. Thirty years ago I remember remarking to a distinguished medical colleague that the time would come when bacteria would be regarded as the source of all pathological conditions. He almost laughed in my face as he said: "They will probably be confined to three or four pathological conditions." Every one of us is well aware that to-day the majority of diseases are attributed to these minute vegetable products, and it is to them that we as dentists and pathologists must devote special attention. I am gratified that bacteriology has become an important study in all our dental colleges, and that the students of to-day are prepared to treat cases and to give an intelligent answer when asked concerning the cause of certain pathological conditions. It is the mission of dentistry to cultivate the minds, not only of this profession and of the medical profession, but of the great laity, so as to enable them to understand that it is unsanitary conditions of life which produce these pathological organisms. I would emphasize the necessity of prophylactic treatment, as I am thoroughly convinced that the bacilli of tuberculosis, being ever present in the oral cavity, are a constant source of disease

and destruction to the human family. It is the duty of the profession to instruct the world concerning prophylaxis of the oral cavity, so that all forms of contamination therein may be removed and not be left to breed disease throughout the system.

Dr. Fillebrown remarked in his report that Miller did not find the gelatinous plaques of Williams a cause of decay. They are certainly not a cause of decay, although Williams has made that positive assertion. Nevertheless, there are certain accretions in the mouth of every individual that cannot be cleaned off, and given the opportunity, tuberculosis will certainly find a place therein for development. Can we not teach in our public schools and go forth as missionaries in regard to this matter, to make the world at large understand that dentistry is something more than the mere filling and extraction of teeth? We should be the leaders in all attempts to improve the condition of humanity.

FIRST PERMANENT MOLAR.

BY J. N. CROUSE, D.D.S., CHICAGO. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

I have been induced to make a plea for a more general preservation of this most important tooth. In this paper I may not express any new thought, or tell this intelligent body anything now unknown on the subject, but I wish rather to incite more earnestness, so that the forceps may be less frequently used, and this organ be more often saved.

I am sure that every practitioner of any considerable experience will agree with me that much too great a percentage of our patients have their masticatory apparatuses deformed and lessened in their usefulness by the loss of these teeth. In many cases the entire occlusal surfaces are changed, and an abnormal position of the teeth has resulted from the early extraction of one or more of the first permanent molars. If the occlusion is not impaired, then there are spaces made that should be occupied by these teeth.

Owing to the fact that these teeth are the first of the permanent set to be erupted, and that at an early age their preservation is many times not thought important by the guardians of the child, they being under the impression that they belong to the deciduous set, therefore, even when it is known that caries is taking place, the

child is not taken to the dentist until perhaps too late to save the organs.

This mistake of not having the child's teeth examined at the proper time is not always the fault of the parents. It surely is a part of the family dentist's duty to keep those in his care informed on all matters which have in view a perfect denture at maturity. In other words, the dentist has other important responsibilities besides repairing the ravages of decay. If he entirely fulfills his mission it will go far beyond simply carrying out the usual program of an office practice. He should be an educator in his special calling in the community in which he lives, and should impart his knowledge earnestly and in a way that will make an impression on his clientele. A mother receiving such information will often transmit it to her relatives or friends who have young children, and so his sphere of usefulness is enlarged. All this is by the way, yet is at the same time a part of the dentist's arduous duties, which is important not only in connection with the care of the first permanent molars, but the thoroughness with which it is done will indicate the success or failure of his whole practice. If he lacks the enthusiasm and ability to get his patients to carry out these instructions, then his other important duties will lack that element which is essential to a successful practice.

The child should be brought to the dentist as soon as the tooth is erupted, which is normally between the sixth and seventh years, although I have cases in mind which were much earlier. In one instance the child when brought to me at the age of five had all first permanent molars in place and all more or less decayed. In this case a most careful parent was misled by my statement that these teeth were erupted between the sixth and seventh years, and the destructive process had therefore gone on some time, until, alarmed by the sensitiveness of the teeth, the mother brought the child to me. Nevertheless, that child, now a woman with a family of children, has all the teeth in her mouth and in a good state of preservation.

The dentist should insist upon seeing the children in his care often and early, with a view of examining the mouth; especially the first permanent molars, as soon as erupted. In fact, in many cases these important organs should have attention before they are fully erupted. A careful examination will often show defects of

more or less magnitude, particularly in the fissures in the grinding surfaces, they having failed to close up completely in their formation, food lodging in them and caries beginning at an early age. They should be cleaned out, generally with an excavator, and softened portions of the tooth removed, and then be filled with cement.

This treatment in my hands has not been followed with uniformly good results, fillings in the same mouths at one time proving very durable and at another time only temporary. The failures, I am sure now, were due to the faultiness of the cement, which in one case caused the loss of the pulp and in several others extensive decay under the cement, yet some of these fillings outwardly looked perfect. These failures caused me to abandon its use for this purpose. Had I known then what I know now I could have averted these mishaps by testing the cement and making sure whether or not it was fit to use. Now I always use cement in these permanent molars where they need early care, which, when properly used, makes a very durable filling, and will tide over the time until the child is older and can have permanent fillings made, which at an early age would not be wise to attempt.

Should this important organ ever be extracted? If so, under what conditions? In two instances I have removed the four permanent molars as soon as erupted, because they were almost devoid of enamel and so poorly developed that it seemed the proper thing to do; whereas, with our advanced system of crowning, they could have been saved. I delayed my decision, however, until I could see the ends of the permanent incisors, which showed but little of the effect of the faulty nutrition which existed when the molars were forming, and the balance of the teeth were well developed. In both cases the second molars took about the same position that would have been occupied by the first had they been allowed to remain, the third molars taking the place of the second, yet the occlusion was very faulty in both mouths. I mean by that that the teeth were not in position to prepare the food for the stomach as well as they would have been had the first molars been kept in place. Besides that, the shape of the mouths was marred to a certain extent. In two or three other instances I have removed the first superior permanent molars to lessen the deformity of the mouth from over-bite, which was hereditary, and I believe the

patients were benefitted by such treatment. It must be borne in mind that the first permanent molar is the tooth that influences the position of all the other teeth, not only until they have erupted, but until they have taken their position and proper occlusion has been started in the mouth. For this reason I make my plea for its preservation, even in extreme cases.

Barring the conditions mentioned, I can hardly conceive of any other wherein I would feel justified in removing the first molars when they were fully erupted, that is, if the roots had attained full growth, or nearly full growth, before the pulp had to be removed on account of exposure or death. There was at one time a number of practitioners, small indeed, who advocated the removal of the first permanent molars as a universal practice. Of late I have not heard much of these extremists, and they have probably all departed to a land where they now know better, or abandoned their folly. There is another class of able practitioners who advocate the removal of the first permanent molars when the necessity for the removal of the pulp occurs at an early age, say before the twelfth year, even though the tooth has been fully erupted. If I understand their teaching, it is that under the age mentioned the roots of such a tooth could not be filled and the tooth be made comfortable. It is with this class that I must differ, and my belief comes from the best source possible—actual practice and experience in the mouth.

I do not now call to mind the removal of the first permanent molar from the mouth of any child I have had charge of, except as already described, and I have taken care of a number of teeth where the pulp was lost one or two years after the tooth was fully erupted, and even some extreme cases where the root had not gotten its full growth, yet such teeth were made comfortable and durable. I am aware that at this early age the apical foramen of the root is large, and the filling of the root requires exceeding care, and I take the position that the chances of success are lessened when attempt is made to fill such roots with gutta-percha, as I believe is the general practice. I have always used oxychlorid of zinc for the filling of roots, and have had difficulty only when it had deteriorated, as the oxychlorids we have been using will do, so that solidification did not take place.

Discussion. *Dr. J. W. Cormany, Mt. Carroll:* This paper is

right along my way of thought and practice, but I would ask Dr. Crouse what we can do with a child, say seven years old, who has an exposed pulp in a first molar, and the tooth is aching badly?

Dr. G. V. Black, Chicago: The management of first molars is one of the most important subjects we can discuss in this meeting, as I regard these teeth as the most important in the mouth. They have the greatest influence in the formation of the features and in the proper development of the bones, muscles and expression of the face. The most important step that can be taken in the saving of this tooth is to impress upon the families in our hands the necessity of caring for it and not allowing it to decay. If we can emphasize to the parents the great danger in which this tooth is we will probably have the opportunity of handling it when we can do so to advantage. But when the tooth is presented to us as Dr. Cormany indicates we are helpless indeed. Almost every day in our college clinic I am compelled out of compassion for children to recommend extraction of these teeth, because it seems the best thing to do. I have observed pretty closely the efforts to save these teeth by removal of the pulp, or treatment of an abscess and filling of the roots, and while there was apparent success in many cases, the teeth have been lost later when it did more harm than its early removal would have done. If the tooth must be lost it should be lost early, as a better condition of the mouth is obtained than if the tooth is lost later. Remember, however, that we never get a perfect mouth when this tooth is lost. I recall some cases where the treatment of the pulp resulted very favorably, and some where I cut away the bulb of the pulp, saving it alive in the canals, and the root was apparently perfectly completed. However, I have not seen a degree of success in such treatment that warrants me at all in recommending it, as the failures are too general. In those years when we nearly all believed so strongly in capping pulps we did seem to save a greater number than we can nowadays. There is a condition in which capping of pulps should be undertaken, and I don't always abandon the first molar because the pulp is exposed, for these pulps will bear more mutilation and recover more rapidly than those in the teeth of adults, so it is worth while to make the effort, as wisely as our experience and judgment will allow. Nevertheless, I would not make a prolonged effort and have the child returning again and again with a severe toothache. Under such conditions the tooth

would better be extracted. My observation in removing the pulps of these teeth earlier than the twelfth year is against the operation. There is more to fear than alveolar abscess, for though that may be avoided, there is a deterioration of the matrix of the dentin that goes on slowly, so that in afterlife the teeth are not strong and will break down despite our best efforts. Furthermore, my experience has been that by far the largest number do abscess after a time. The canal and apical foramen are too large and there is too much tissue exposed to the filling material. In some cases cementum may be laid down, but it will not occur often enough to justify the procedure. The method of treatment that Dr. Crouse has outlined—filling these teeth with cement and covering with a gold cap—is most excellent, as they will be protected and preserved until they can be filled, if necessary, or until the child is old enough to have sufficient self-control to enable us to operate properly.

Dr. Crouse spoke of decay recurring under fillings, but our experience, knowledge and clinical observation are against it. It is safer to say that there was an error of observation than that this thing has occurred.

Dr. C. B. Rohland, Alton: I should like to ask Dr. Black what he would do with a boy twelve years old whose mouth presents the following conditions: Second molars just beginning to arrive; one of the first molars abscessed and the crown entirely broken away; two others with exposed pulps and crowns broken away so that filling would be impossible; the pulp not exposed in the fourth one, and while the tooth is badly broken down it could probably be filled. In other words, the four first molars, including the one with pulp intact, are so badly decayed that there seems to be no show of saving them.

Dr. Black: Take out the whole lot.

Dr. G. H. Henderson, Springfield: It is undoubtedly true that the first permanent molar is the keystone of the arch and the all-important tooth, and while Dr. Crouse has told us that the patients under our care must be watched, what are we to do when nine out of ten children hardly know what a dentist is, and when perhaps their parents have never been in a dental office. The trouble is that we don't do half enough to educate the public as to the importance of the first permanent molars. Whenever I have a school-teacher in the chair I am glad to spend considerable time educating her, but

teachers don't get to the children early enough. Important facts concerning the teeth should be in the school text-books. The present school physiologies are woefully deficient in this regard. Many parents would not wittingly allow a single one of their children's teeth to be lost, but they don't know the importance of early dental inspection, so the harm is done before we are called upon. These important facts ought to be given to the people of the land.

Dr. J. H. Woolley, Chicago: Last fall the Northern Illinois Society had a paper on children's teeth, and some action was taken with regard to publishing a little pamphlet for mothers giving instruction about the teeth.

Dr. Cormany: I am chairman of the committee that was appointed. The expense of the book was to be paid out of the treasury, and each member was to receive a certain number free of charge. However, we learned that the National Association was getting out a pamphlet of the same kind, so waited to see what it would be. If it does not appear soon we will proceed independently.

Dr. Edmund Noyes, Chicago: Twice in the past this society appointed a committee to prepare such a pamphlet. The first was written by Dr. Judd, but the demand was very small, and the members took so little interest in the work as to make it discouraging. Some years later I was appointed to the same office, but although I spent much time and effort in making the pamphlet suitable for its purpose, the matter had so little popularity and success as to daunt the most enthusiastic.

Dr. Crouse, closing discussion: I was induced to write this paper by hearing in other meetings just such remarks as have been offered here. I do not like to differ with such an authority as Dr. Black, but my experience has been so different from his that I am compelled to. I have to-day in my own mouth two first molars, one of which abscessed when I was nine years old and the other a year later, but they are now comfortable and serviceable. There must be some cause for the difference between my experience and that of others, as I have not exaggerated my success. If a dentist extracted first molars for a child of mine I would sue him for damages, as the harm to the mouth in taking out those four teeth is much greater than in leaving them in position, even though they are not so serviceable as those with live pulps. I have more faith than Dr. Black in pulpless teeth. I never destroy the pulp if it can be avoided, but I

could not bring myself to extract the first permanent molars merely because the pulps were dead—at any rate not until I had given them a fair trial. Somebody is mistaken, and it would require more proof than has been submitted here to convince me that it is I, for my clinical experience is about as long and good as the next man's. In reply to Dr. Cormany, I would keep the tooth from aching if possible, but if it persisted I would fill the root and keep the tooth in position as long as possible.

OPERATIVE DENTISTRY—INCIDENTS OF OFFICE PRACTICE.

BY C. N. JOHNSON, D.D.S., CHICAGO. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

First I would report a disastrous failure which may be more instructive than a success would be. A lady came to me with a very badly discolored central incisor, and stated that at one time it had been bleached successfully, had remained so temporarily, and then had discolored worse than ever. The tooth had been opened from the lingual surface and I removed the filling. Twenty-five per cent pyrozone was applied with apparent success, but in forty-eight hours the discoloration was as bad as ever. I then sealed pyrozone in the cavity for twenty-four hours; the tooth bleached out perfectly, but again became discolored. Next I used sodium dioxid in the ordinary way, bleaching the tooth successfully while the patient was in the chair, but in twenty-four hours it was as black as ever. Then I was ready to give up, but the patient insisted that the tooth must be bleached, so in desperation I sealed a small quantity of sodium dioxid in the tooth and instructed patient to return in twenty-four hours. She did not come back for three days, and then I found a considerable amount of gum tissue over the labial portion of the root entirely eaten away, so that when I picked it off the root there was exposed for four or five millimeters from the normal gingival margin. I then found that in the previous opening through the lingual surface the drill had gone through the tooth and opened the side of the root on the labial surface. In removing the filling I did not get it all out clear to that point. The pyrozone did not irritate the tissue at all, but the sodium dioxid found a slight opening and ate the gum away. I

then discovered that there was some gutta-percha where the attempt had been made to fill the artificial opening. Here was a problem, as the tooth was ruined, and the gum tissue could never be brought down over the root to its normal form. After a good deal of explanation on my part, to hide the mistake which the previous dentist had made in drilling through the root, I constructed a porcelain crown, using gum enamel to fill in the place where the gum had been eaten away, and succeeded in making quite a presentable tooth out of it.

Recently a physician sent a patient to me with the statement that there was serious antral trouble and that it was necessary for me to extract the tooth. I examined the case and found an upper bicuspid abscessed, but upon inquiry of the patient could trace no trouble whatever to the antrum. The buccal root of the first bicuspid showed perfectly in the opening. The patient was much disturbed at the physician's report, so I quieted her fears, and packed some gauze and cotton in the opening, so that I might see the root more clearly. At the next sitting I cut off the end of the root with a drill. The tooth had a beautiful gold filling in it which seemed perfect, and when the patient told me who had inserted it I knew the operator had done the best he could. After cutting off the end of the root and reaming out the opening in the bone I found that the apical end of the root had not been perfectly filled. I did not want to remove the gold filling, so I cleaned out the canal from the apical end as well as I could down to the point where the gutta-percha was, and built up on it to the apex. The tissue healed beautifully over the filling and root, and there was an absolute cure without disturbing the antrum.

In the next case I did something which is usually condemned, but here it seemed advisable. A gentleman came to me with fillings in the mesio-occlusal surface of the upper third molar and the disto-occlusal surface of the second molar. The second molar extended far beyond the occlusal surface of the third molar because of the loss of some teeth in the lower jaw. The lower third molar struck against the occlusal surface of the upper third molar and slightly against the distal surface of the second molar. To fill these cavities and have them separate always resulted in the packing of food in there and the dislodgment of the fillings. The fillings failed before the patient came to me, and they failed in my hands, so I could see no way out of the difficulty unless the interproximal space could be bridged. I

therefore filled the two cavities, bridging across from the second to the third molar solidly with amalgam. I then polished the filling and told the patient that it would probably be a failure, for we all know that if we build fillings together in that way under ordinary circumstances one will be loosened. In this case, however, the occlusion was such that neither of the fillings became loose, and the operation is still a success after five years' trial.

I would now refer to two or three typical cases pertaining particularly to the management of our patients. A girl sixteen years old was brought to me by her aunt, with the remark that her teeth had been neglected simply because she was so afraid of a dentist. I found about twenty-five cavities, but the patient was so nervous that it was only under compulsion she came to my office at all. If ever a case required heroic and thorough treatment that one did, but if I had operated heroically I would have discouraged the patient at the first sitting. In looking over the mouth I found one or two large amalgam fillings, and it was the insertion of these that had given the patient such a dread of dentistry. I treated her very gently and disarmed her suspicions as far as possible. I did the best I could with cement and gutta-percha, and treated the patient much more than I did the teeth. Finally they were all filled and the aunt reported that the child would never again dread a dental office. When the proper time comes, and the patient has more stamina than she now possesses, I shall put permanent fillings in those teeth, and I expect to be able to save them.

The next case was a boy. I can get along pretty well with the girls, but when it comes to the boys—. This boy wasn't nervous, but he was unmanageable, and if the chair had been without arms he would have wriggled all over the room as well as all over the chair. He admitted that the work did not hurt very much, but he continued to be intractable. First I was tempted to read him the riot act and dismiss him, but on second thought I determined to get him under control. After he had had a few sittings, and I was getting on nicely with the work, he confided to me that up to this time he had always gotten out of having dentistry done by yelling and cutting up, and that several dentists had refused to work for him. After he found that such tactics would not daunt me he gave up and became a very fair patient. I think that breaking in the colts and making good patients out of them is one of the most beneficial things we can do

for dentistry and for ourselves, as it inculcates self-control as well as control over the patients.

Recently a very nice woman was driven into my office by the force of necessity. Severe operations in the past had given her such a dread of dentistry that she came to me only because her husband insisted upon it. After much persuasion I got her into the chair, and first of all cleaned her teeth. I complimented her on not being nervous about it, and she replied that what was worrying her was a loose molar which she knew must come out, but she could not stand it without an anesthetic, and her physician had forbidden that. I instantly determined to extract that tooth before she left the chair, so after much argument she allowed me to apply a "local anesthetic" (which was a little water applied with cotton to the gum), and in spite of her constant protests I finally by sheer force of persistence lifted the tooth out with my thumb and finger. The preliminary work took an hour and a half, but it was the best time I ever expended, as I entirely removed her dread of dental operations. The moral I wish to draw is this, that our chief duty to patients is not so much to make perfect fillings, although they are of course of great importance, but to study the people and obtain such control over them that they will lose their dread of the chair. There is no tooth that cannot be filled with tolerable comfort to the patient if the dentist will study the individual, yet hundreds of teeth are lost because their owners will not have them filled on account of the pain.

Discussion. *Dr. J. W. Cormany*, Mt. Carroll: I wish to ask Dr. Johnson a few questions. Suppose in the destruction of the pulp some of the paste gets out into the interproximal space and raises a disturbance, leaving a very severe condition of inflammation and a badly aching tooth; what would you do?

Dr. Johnson: I should treat it with a soothing antiseptic, see that the parts were kept absolutely clean, watch the case carefully so as to be able to remove any loose bone the moment it appeared, and keep the wound in a thoroughly aseptic condition until it healed.

Dr. Cormany: Suppose we have a good gold filling except on one side. Perhaps the margin of the cavity was not prepared just right and there is a little decayed spot in the gingival space. The filling is on the bucco-mesial surface of the first molar, and the cavity is between the enamel and gold; what would you do?

Dr. Johnson: That is a proximo-occlusal filling. If it were per-

fect in every other respect I would get rid of the gum by packing gutta-percha until perfect access was secured, and unless the failure had gone too far between the teeth I should repair the filling, employing tin and gold, amalgam, or gutta-percha, as the case might be.

Dr. Cormany: Suppose you put on a Richmond crown, and in articulating you grind a little hole through it; what do you do?

Dr. Johnson: I have never found it necessary to grind a hole through a crown in order to obtain correct occlusion, but if I should be so unfortunate I would reinvest the crown and cover the hole with solder.

Dr. Cormany: Suppose you have applied arsenic to devitalize a pulp, and upon opening up the pulp chamber you find the pulp still sensitive, and it remains in that condition for a week or a month; what would you do?

Dr. Johnson: I should look pretty hard for pulp stones, and would generally find them.

Dr. Cormany: I have lately found that a combination of one-eighth of a grain of cocain and one drop of carbolic acid applied to that pulp will enable me to remove it in five minutes without a particle of pain. After you have extracted a pulp and have dried out the cavity thoroughly, you begin to introduce your gutta-percha and hemorrhage sets in; what would you do?

Dr. Johnson: I should pack the canal with adrenalin chlorid, which is one of the best agents for stopping hemorrhage at any point that I have ever used.

Dr. C. J. Sowle, Rockford: I wonder if we ever stop to think why people come to us in fear and trembling. It is a peculiar fact that patients will exaggerate everything done in the dental chair, and they always take particular pains to make these rash statements at home before the children, so of course the little ones are frightened at the very mention of a dentist. We ought to overcome this, and tell our patients not to exaggerate these things before their children. I have a fault to find with the country dentist, namely, that when farmers' children come to him, and he knows their parents will not pay for permanent work, instead of gaining the children's confidence before extracting a tooth, he rushes for his forceps and yanks the offending member out, scaring the children quite as much as they are hurt.

Dr. M. R. Harned, Rockford: My rule with children is never to hurt them at the first sitting, but to spend all the time if necessary in

examination of the mouth and dispelling their fears. Recently a woman came twenty miles with her little girl, who had a very small cavity in a first molar. I spent an hour in coaxing, entertaining and shaming her, in all of which the mother assisted me, but I was unable to do anything with the child, so I sent her out of the room and attended to some other patients. After awhile she again got in the chair and the same performance started. I saw that she was not frightened at all, but was simply stubborn, so I said, "I shall be very glad to fix your teeth while your mother is here, and if you will behave it won't hurt you at all, but I am going to fix your teeth, and if you don't behave I shall lock your mother out of the room, and the more you struggle the more it will hurt." She would not give up, so I forced the bur into the cavity, drilled it out, and handled her rather roughly. While so doing I discovered another cavity, and when I began to work on it the child acted as nicely as possible, with the result that she was hurt hardly at all. This was a case where force was justifiable, but I believe thoroughly in managing children in some other way if possible.

Dr. S. F. Duncan, Joliet: One of the most unfortunate things that can happen to the dentist is to have the mother come with the child, and I make it a rule to have the mother stay away or at least not remain in the office. A healthy eight-year-old was absolutely unmanageable through two sittings while his mother was in the room. The third time I sent her away and the child was meek as a lamb. Children always know how to work on their parents' sympathy, and will act up in their presence as they would be ashamed to do if they were with the dentist alone.

Dr. Edmund Noyes, Chicago: At least half the fathers and mothers of our patients have average good sense, and at least fifty per cent of the mothers who come to me with their children are more help than hindrance in the office.

Dr. G. D. Sitherwood, Bloomington: It all depends on how much influence the parents have over the child. In some cases it is absolutely necessary that the mother sits beside the chair, and if the child then behaves it is of course the proper thing to do. We should not treat children as children, but as adults, with the same respect, kindness and care, for they have feelings and sensibilities, and they know what is said to them quite as well as though they were older. I have more difficulty with grown people than with children, for after

a child is once started right it remains so, which is not the case with adults. I believe in oxyphosphate for children's teeth, using gold or amalgam later and at the proper time.

Dr. F. H. Skinner, Chicago: I would relate an operation on an infant fourteen months old. The right central incisor was abscessed, the lip was swollen out even with his nose, and the four superior incisors were decayed nearly to the gum line. At the suggestion of Dr. A. H. Peck, the family physician administered ether and I lanced the abscess. The pulp canal and abscess were well washed out with water, hydrogen peroxid, and Black's "1, 2, 3" was run through. I also took the pulps out of the other central and the two laterals. The canals were so large that cones were made from S. S. White's seal dressing to fill the roots, and the crowns were built up with "Fellowship" alloy. Two hours after the operation the child was eating, and for two years since he has had no trouble.

Dr. C. P. Pruyn, Chicago: About three years ago a man presented for treatment, and a left upper second molar had all the appearance of pyorrhea. I removed the deposits and treated the tooth carefully and for a long time, but there was a continual discharge, so I finally extracted it. Then the jaw would not heal, and it proved to be a case of tuberculosis, assuming a carious form. During the past two years I have operated surgically three times, and have used chlorid of zinc, sulphuric acid and the whole list of remedies indicated. For the last three months the patient has been treated with tuberculin, and it looks now as though I might be able to cure the discharge. This is not a case of marked tuberculosis, although the patient was told six years ago that he had the disease. When he presented his mouth did not show anything abnormal, except that the gum would not heal, and later the bone would not heal.

PROSTHETIC DENTISTRY—INCIDENTS OF OFFICE PRACTICE.

BY C. P. PRUYN, D.D.S. CHICAGO. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

When Dr. Cormany wrote that he had put me on to open this discussion I replied that it would be better for someone who was teaching the subject to take the leading part. He wrote back that he didn't want those men to open it, because they were such great talkers that

when once started they would not know when to stop. I presume this was a hint that I should say as little as possible.

I am very glad that the subject of prosthesis is receiving so much attention from the profession to-day. Only a few years ago it was relegated to a dark laboratory and little nice work was done, but now the pendulum has swung the other way. While we were greatly pleased with the advent of what seemed at the time a great blessing—vulcanite rubber—we must admit that it has been a detriment to the practice of dentistry, and the time has now come when we must seek something better. While rubber has the advantages of cheapness and rapidity of manipulation, we all admit that under rubber plates the tissue shrinks away and the features are distorted. I believe that in the near future someone will discover a cheap metal plate to take the place of rubber. Watts' and Weston's metals should be used oftener for full upper dentures. Cast aluminum has proven a comparative failure, but swaged aluminum is doing nicely, although it does not thoroughly satisfy the needs of the case. Dr. J. B. Palmer has shown me a method of making models for swaging plates which is of especial value in those cases of great overhanging of the gum, where it is difficult to make a cast and have it draw. The method is to take an impression, prepare it, get the cast, pour upon it plaster and asbestos, half and half, and when that has set remove the plaster cast. If you have a case where there is considerable overhanging, and where in the removal of the plaster cast you might perhaps break the outer rim of the plaster and asbestos impression, you can easily put those parts together again. The mould is then thoroughly dried, and into it you cast the metal. In a few instances for partial upper metal plates I have used clasp metal instead of gold. It is a little more difficult to swage, but it makes a very rigid, light, thin plate, and one that when once swaged to place will stay there indefinitely.

Clasps for cuspids. The cuspid is a very hard tooth to clasp, but a few years ago I accidentally stumbled onto a good plan. Instead of clasping the cuspid from behind forward it is clasped from within outward. In this way you reach either side of the tooth, the mesial and distal, which is especially valuable in lower cases.

If we would make more removable bridges, even though they were constructed of rubber with clasps, instead of so many fixed bridges, we would do our patients a great service. I think a great mistake is made in many cases where a permanent bridge is set.

You have all been troubled by the pendulous gum which is frequently found where a rubber plate has been worn a number of years. It generally extends from the second bicuspid on one side to the same tooth on the other, and is very annoying. In many cases we have found it necessary to remove this gum surgically, but there is another method of procedure. Place some oxyphosphate of zinc in the old plate, and crowd it into position while still soft. After this has been worn a few days, put in a little more cement, and by pressure you can remove all this tissue.

Discussion. *Dr. J. W. Cormany*, Mt. Carroll: You speak disparagingly of rubber plates, but of course we have to use them in the country. Suppose you had a case waxed up, and you heated the flask to warm up the wax a little, but overdid it and the wax melted and ran all round the teeth. Then suppose we finish vulcanizing a plate and forget about it for a few hours, how do you remove the granular plaster which sticks so? In the first case I cool the flask off at once under the faucet and then boil out the wax, and in the second case I clean off the plaster with a brush and pumice stone.

Dr. Pruyn: In both these cases I know no better procedure than yours.

Dr. G. M. Brunson, Joliet: What do you think of rubber plates with aluminum lining?

Dr. Pruyn: I don't think much of them, as the rubber is still there and retains the heat just the same. I forgot to mention one point—the repairing of rubber plates. Suppose the plate has been broken straight through the center. My method is to wax the parts together, run plaster in the palatal portion and hold the form, then take the plate off and cut out all of the old rubber that presents to the tongue, cutting up underneath the shoulders of the teeth so that the pins are exposed, then pack in new rubber, and the repair will show only in a little place on the tuberosities just back of the molars on either side. In some cases where a plate has been worn for a number of years and some shrinkage has taken place, I scrape the cast considerably, and then by mounting with new rubber I can make a better and stronger case, and perhaps save the patient the necessity of getting a new plate for a number of years.

Dr. S. F. Duncan, Joliet: With regard to removing the granular plaster from a plate, if the model has been covered with tin foil this can be simply peeled off, leaving the plate perfectly clean.

Dr. G. E. Warren, Pontiac: I am indebted to Prof. Taft of the Chicago Art Institute for the formula of a preparation that is used in the Institute for separating plaster casts. It is what you might call a saturated solution of soap-suds. Strain it and add equal parts of lard oil. A little coloring may be used if desired. This preparation is simple and inexpensive and separates cleaner than anything I have ever used. In time the ingredients will separate a little and the bottle will have to be shaken.

Dr. J. T. Dixon, Chicago: A lady presented with very prominent gums. The broken crowns of the teeth had been cut away in order to be crowned for bridgework by one of our dental parlors, and in order to get the bridge on the workman had drilled through the side of the roots. After a long and faithful effort to heal the openings I was forced to abandon the idea. The patient did not want to wear a plate because she was afraid the gum would show, so I removed the roots and used very long teeth with a short bite. I trimmed the ends of the teeth and fitted them into the alveoli, and put the plate in in that way with no gum in front. The patient is very much pleased with the satisfactory result, the teeth look natural, and I hope to retain the normal shape of the front of the mouth by having long teeth up in the gum.

Dr. G. D. Sitherwood, Bloomington: Dr. Cormany says he heated that flask to separate, to warm the wax. I supposed that every dentist nowadays in making a plate filled his flask with plaster, and when the plaster heated in setting took his hands and separated the flask without any heating whatever.

Dr. J. G. Reid, Chicago: Recently I inserted a bridge for a lady eighty-four years old. It extended from one lateral to the opposite cuspid. The two teeth stood at opposing angles to each other, and there was at least a quarter of an inch difference between the distance between the points of the teeth and the necks. I placed a heavy silk thread, about a BB silk twist, over the points of the teeth, then placed a small piece of wood between the two threads and began to twist. After an hour's slow, careful work the points of the teeth were moved sufficiently that I could slip the bridge over. It went on easily—the teeth moved back to place at once, and the patient went away comfortable and happy.

Dr. Sitherwood: I don't think plates of aluminum or Watts' metal are used as much as they should be, especially Watts' or Weston's

metal for lower dentures. Gum sections can be used if too much metal is not employed, and beautiful and satisfactory work can be made at a comparatively low cost.

A SIMPLE MATRIX.

BY W. G. CLARK, D.D.S., CHICAGO. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

I will present for your consideration a matrix and method of adjustment that may serve as a compromise for extremists—those who never use aids of this kind and those who favor more complicated mechanical appliances.

The material is sheet steel, rolled thin enough to be elastic and thick enough to be sufficiently stable, with a polished surface. This is cut into strips long enough to reach beyond the tooth on either side and wide enough to reach beyond the cervical margin and above the grinding surface. The cervical side may be cut in a circular form to avoid wounding the gum tissue.

We will suppose the cavity has been prepared according to the modern idea of extending for prevention of future decay, and that the rubber dam is in place. The next step I deem of great importance—filling the cervical portion and beyond the angles with pellets of tin or soft gold *before* adjusting the matrix. The filling material should be malleted against the cervical margin and allowed to lap over, then with a flat burnisher press the mass against the neck of the tooth until it assumes a form approximating the natural condition.

In cutting the steel you will observe that as the blades of the shears pass each other the edge of the strip is bent to a sharp concavo-convex form. When introduced between the teeth the convex side should be next the filling. This serves a double purpose, as it slides to place without tearing the foil, and keeps the wedge from passing beyond the edge of the matrix.

The matrix is held in position by a wooden wedge made thicker next the gum, conforming to the shape of the interproximal space, and can be made wide or narrow as the conditions require. It should usually be introduced from the lingual side, but that is not always necessary.

The pellets in place can be further condensed, cohesive gold added, and the filling finished in the usual manner. Portions of

gold may be packed in the triangular space between the margin and the strip, and the ends can be bent back to allow the insertion of a foot plugger to condense the gold thoroughly against the beveled margin.

This form of matrix is useful when filling cavities in the proximal surfaces of molars and bicusps, and the disto-approximal surfaces of cuspids where the adjoining teeth are in position. It allows the cervical margin to be perfectly covered before it is applied, and the other margins are accessible at any stage of the operation. It gives support to the filling at the proper place—the extreme portion of the contour. It can be easily and quickly prepared and applied.

Discussion. *Dr. C. J. Sowle*, Rockford: You are probably all familiar with the fact that I demonstrated the use of separating rubber as a wedge in place of wood, over which it has many advantages. The interproximate space determines the size and thickness of the piece of rubber to be used. The matrix is placed in position and the separating rubber added. If the matrix fits tightly against the adjacent tooth, by putting a little vaselin on the rubber it can be stretched out and slipped in between. It will force the matrix to place along the cervical margin, yet will yield enough to allow the filling material to cover the margin at every point. The rubber will spread the teeth enough that when you have built the filling down to the contact point, using a very thin matrix, you will have sufficient separation to give the tooth its natural contour. Now remove the matrix, leaving the rubber in place, finish the filling on buccal and lingual margins and contact point, remove the rubber and finish with strip to the cervical margin. I believe that separating rubber saves me at least half an hour on each operation.

PORCELAIN WORK—INCIDENTS OF OFFICE PRACTICE.

BY A. W. M'CANDLESS, D.D.S., CHICAGO. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

I feel that it would be almost presumption on my part to attempt to tell anyone here any one thing about porcelain work. Many years ago I saw that it was to fill a very important place in the practice of dentistry, but had I also seen the rocky road I must travel before I reached the standard of to-day I fear I should have lost courage and

at least have waited for someone else to do the experimenting. I well remember when bridgework first came out seventeen or eighteen years ago. I was opposed to it, as it seemed to me unsanitary, uncleanly and at best temporary, but I soon became convinced that it had its place, and if I were to be a progressive dentist and keep abreast of the times, I must acquire skill in bridgework, and as bridgework goes I became somewhat proficient in the work, enough so at least to convince my patients that they could trust me to have it done. So when the agitation of porcelain work began it was only a step further, and I was not long in making up my mind to climb into the band-wagon. I had the utmost confidence in the ultimate success of the work, and felt it was my duty to the profession to help solve the problem.

The first great step towards its solution was when we discovered that low-fusing bodies had not the required strength. Then we began to use high-fusing bodies, only to discover that the heat required to fuse them was so great as to weaken the metallic joints through the drinking up of the pure gold solder by the platinum. Then Dr. Ames told us to use platinum solder. Next Dr. Taggart discovered that a vital element of weakness in porcelain work was in allowing the truss of the bridge or the post of the crown to extend up too far, and told us we must get the metal parts out of the way as much as possible consistent with strength in order to get bulk of porcelain. I think I need say nothing of the preparation of the root for a porcelain crown, except to remark that I never fitted bicuspid and molar roots as accurately and nicely as I do since I began preparing them for porcelain crowns. The reason is certainly obvious without explanation. The porcelain facings should be concave to correspond to the labial or buccal aspects of the bands and extended over the entire width of the band. It is seldom necessary to have any part of the post extend beyond the cap or cope if the pins of the facing are bent downward, as they will reach the cap where they may be soldered. The porcelain to be added to conform the tooth to its natural shape should be high-fusing and finely ground, because cusps cannot be carved so well otherwise.

I always set crowns and bridges with gutta-percha, and there are many reasons for its use, one of which is that in case of accident it is an easy matter to remove a crown or bridge by the application of a little heat. For this purpose I have modified a little a contrivance of

Dr. Taggart's. I solder a little platinum tube in the metal end of a chip-blower, and connect the other end with rubber tubing to the gas jet. I then turn the gas down until I have a very small flame and apply it to the tooth, and it will quickly heat up a crown or bridge so that it can be removed. I use the Kerr electric annealer for heating the gutta-percha, and before putting the gutta-percha into the caps they should be smeared with oil of cajuput, so that the gutta-percha will stick to the metal.

Dr. C. B. Rohland, Alton: In removing bridges set with gutta-percha I simply revolve a leather wheel in the electric engine at a high rate of speed, and can make a crown so hot in this way by friction that not only will the gutta-percha be softened, but the patient will be made uncomfortable if it is continued.

Dr. C. J. Sowle, Rockford: Great care should be taken not to overheat the gutta-percha, for if that is done its firmness and sticky quality will be lost and failure may result.

Dr. H. J. Goslee, Chicago: There is no question in my mind as to the success of porcelain crown, bridge and inlay work. It is simply a question of observing the minutest details and using the proper material. The root must be properly prepared, in order that as much room as possible may be secured for the porcelain, because its strength increases in proportion to its bulk. The metal construction should possess sufficient strength, and this is made possible by the use of platinum solder, because the joint is not subsequently weakened to any extent by the refusing of the solder while the porcelain is being baked. Of course, the adaptation of the porcelain facings must be carried to the gum in order that no joint or differentiation in color shall exist. There is no physical union between porcelain and platinum. Then the joint must be made smooth, flush and continuous between facing and band. As an aid to permanency, the overlapping of the facing upon the band forms a mechanical retention for the porcelain which is placed there. Whenever we hope to add porcelain to platinum the retention must be mechanical, and as it is very desirable to have a perfectly smooth joint at this point, the overlapping of the facing, and the further precaution of having a slight space between the neck of facing and the platinum, will enable us to anchor that facing there so that it will not subsequently be fractured. A high-fusing body should be used, and a very important detail must be

watched carefully, namely, packing the material. Much of the strength of porcelain is secured by properly packing it during the building-up process. If it is mixed thin and simply poured, not so much strength is secured as could be otherwise. It should be mixed as thickly as expedient, the moisture should be brought to the surface and evaporated as the mass is built up, and the body should be condensed and packed as tight as possible. Some feel that much artistic ability is required to carve porcelain, but by setting the plaster model of a case before us we should be able to reproduce a specified tooth without difficulty. Probably two-thirds of the failures in porcelain work are due to overbaking the porcelain. By so doing we entirely destroy its integrity, its color, and are likely to take away much of its strength. I would much rather have a crown under than overbaked. Baking is simply a matter of experience, and unless one has had experience no test will avail much. It is a good plan to experiment by fusing little cubes of porcelain in the furnace. Always place the crown or bridge in the furnace so that the porcelain can be easily seen. If all these little details are observed there is no reason why anyone cannot do successful and artistic porcelain work.

REPORT OF THE SUPERVISOR OF CLINICS.

BY D. M. GALLIE, D.D.S., CHICAGO. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

1. C. J. Sowle, Rockford. *Gold Filling, Using Matrix and Separating Rubber in a Mesio-Occlusal Cavity in Right Superior First Bicuspid.* The principal feature of this clinic was the use of a heavy piece of rubber between the opposing tooth and the matrix. It seemed to offer all the advantages claimed for it by the author, namely, sufficient springiness of the matrix to enable the gold to be carried over the margins of the cavity, also securing space for finishing without laceration of the gums. The filling was well finished and the contact good.

2. H. W. McMillan, Roseville. *Some Convenient Things About an Office.* Dr. McMillan exhibited a working file original in design, consisting of alphabetical placings of patients for record purposes. It was novel and serviceable; also a liquid celluloid for the repair of broken impressions and models—a good thing to have about the

office. Also a cavity-cutting outfit for artificial teeth, and several other handy articles of interest to the practitioner.

3. Geo. W. Cook, Chicago. *Individual Treatment of Pyorrhea Alveolaris*. The gentleman recommends a different treatment for different conditions of the disease. In severe cases he advises a combination of crude sulphuric acid and crude carbolic acid, making a product known as sulphonic acid. Three cases were treated, one in the opinion of the committee being calcific inflammation, and the deposits in each case were apparently removed.

4. M. R. Harned, Rockford. *Preparation of Cavities in Artificial Teeth*. Dr. Harned showed an ingenious method of cutting a groove in plate teeth with emery stone and allowing the cutting to extend through the lingual aspect of the tooth. He then vulcanized the tooth to the base plate, and, using the rubber as a foundation, built the gold in upon the rubber, depending upon the lateral grooves for retention.

5. J. W. Bridges, Chicago. *Inlays*. Clinician unavoidably absent.

6. J. J. Reed, Rockford. *Cement Anchorage for Gold Filling*. A thin film of cement is placed in the cavity, and while it is still soft a piece of crystal gold is pressed into it and the excess forced out, care being taken that cement does not flow over surface of gold. After waiting a short time for the cement to harden the gold filling is begun. Tests were made to dislodge the filling, and although pieces of gold were displaced, the filling remained. This method of anchorage seems feasible for some cases. Dr. Reed was responsible for the operating inclosures that were used, and they spoke for themselves at the clinic.

7. W. T. Reeves, Chicago. *Porcelain Inlay*. A lateral cavity in left inferior cuspid. Matrix burnished, baking and setting inlay at one sitting. The result was an accurate adaptation of the inlay to the margins and walls of the cavity. Slightly off in shade, but otherwise a very artistic operation.

8. F. S. Trickey, Freeport. *Gold Filling*. Clinician unavoidably absent.

9. H. J. Goslee, Chicago. *Construction of Saddles for Porcelain Bridges, and Carving Cusps for Crown and Bridgework*. Also an ingenious method of wiring the teeth together in case of fractured maxilla with 24-gauge German silver wire. This method has many

advantages over the old and more cumbersome interdental splints. Also a neat and effective scheme of drawing the edges of a gold crown to adapt it to the conformation of the root after the crown is set. It consisted of a loop of 24-gauge G. S. wire, engaging the cervical circumference of the band, and with lingual surface flattened. A few twists of the wire will cause the edges to bend to conform to the irregularities of the root.

10. R. J. Cruise, Chicago. *Extraction and Replantation*. No suitable case presented.

11. B. J. Cigrand, Chicago. *A Gnathomonic Mimic Showing the Philosophy of Mastication*. This instrument demonstrates to a nicety the principles involved in the Bonwill system of articulation. As we understand it, the articulator is the embodiment of the ideas of Dr. Cigrand, and makes possible all movements of which the jaws are capable. While the Committee recognize the importance of this instrument, we question the feasibility of saddling another addition upon our nomenclature.

12. K. B. Davis, Springfield. *Crown and Bridgework*. Clinician ill.

13. L. O. Green, Chicago. *Banded Logan Crown*. Clinician absent and sent no explanation or excuse.

14. L. S. Tenney, Chicago. *Gold and Platinum Restoration, Using Engine Mallet*. A superior right central, distal surface to incisal edge. Cavity prepared in accordance with accepted theories, and restoration complete. A successful operation in every way.

15. C. P. Pruyn, Chicago. *Removal of Pulp by Pressure Anesthesia*. Left superior first molar with large occlusal cavity and exposure of pulp. Dam was adjusted over both adjoining teeth, softened decay removed, and small pledget of cotton saturated with an alcoholic and ethereal solution of cocain hydrochlorate introduced into the cavity. Then a piece of vulcanite rubber size of cavity was placed on the cotton and pressure was applied with a large burnisher. For an instant only there was a little pain, and in three minutes anesthesia was complete. A large bur was then used to open the pulp chamber, and the pulp was thoroughly and painlessly removed with a barbed broach.

16. C. B. Sawyer, Jacksonville. *Gold Filling in Labio-Cervical Cavity, Using Clamp of Own Design*. The principal feature of this clinic was the excellence of the clamp, it being especially applicable

to labio-cervical cavities, having three points of bearing—labial, lingual and coronal. The filling was good in execution and finish.

17. E. R. Carpenter, Chicago. *Removal of Pulp with Pressure Anesthesia*. Inferior left second bicuspid, mesio-occlusal cavity, pulp exposed. A successful demonstration of this method of removing pulps. Technique the same as that of No. 15.

18. E. F. Hazell, Springfield. *Gold Filling in Superior Right First Molar, Using Matrix*. Mesio-occlusal cavity. Filling started with Solila gold and finished with Ney's foil. Condensed with engine mallet. Cavity prepared according to the methods taught at present. Filling well finished and the contact point good. The Committee believes this cavity could have been filled just as well without using a matrix.

19. J. E. Hinkins, Chicago. *The Use of Kowarska's Cement as a Splint for Loose Teeth*. After thoroughly removing deposits and cleaning teeth at previous sitting, Dr. Hinkins applies the dam and ligates the teeth with floss in the usual figure eight. He then applies the cement carefully with a spatula, covering the ligature and surface of teeth, and allows about an hour for cement to harden, polishing at subsequent sitting. His formula for the cement is—Celluloid 160 parts; Acetone (Merck) 400 parts.

20. W. Girling, Chicago. *A Porcelain Crown Built Solidly from the Platinum Cap to the Proper Occlusion Without the Use of the Ordinary Facing Soldered to the Cap*. The platinum cap is made in the ordinary way, with dowel pin slightly above the surface of the cap. The platinum surface of the cap is well roughened with a file to give the porcelain good attachment. The porcelain is shaded from the beginning to the enamel surface, to match the adjacent teeth by means of different layers of the necessary shades of porcelain, to produce the natural effect. Doing away with any grinding and the extra strength gained by one solid mass of porcelain, are the desirable results obtained. The crown when completed was an artistic piece of work.

21. C. S. Case, Chicago. *New Form of Artificial Palate*. The principal features of Dr Case's new method of constructing an artificial velum are—1. The introduction of a flexible wire to be used in forming the posterior border of the model of the veil. 2. The ability to see the posterior wall of pharynx above the wire. 3. The ease with which the wire may be made to take the correct shape by

being able to see the wall of pharynx above the wire. 4. The construction of a thick roll of rubber to form the border of velum, preventing curling of the veil, but allowing an easy movement.

22. G. B. Perry, Chicago. *Mounting and Turning Lathe and Engine Wheels*. Clinician unavoidably absent because of sickness.

23. J. O. Brown, Chicago. *Gold Filling*. Clinician failed to appear and sent no explanation or excuse for his absence.

24. Hugo Franz, Chicago. *Surgical Healing of Chronic Alveolar Abscess*. Clinician present, but no suitable case could be found.

25. Edmund Noyes, Chicago. *Root Canal Filling*. Hill's stopping and eucalyptus extract were used. The canals filled were in an upper molar, from which Dr. Pruyn had removed the pulp but a few moments previous. There was considerable hemorrhage, and one canal was so constricted as to make the upper portion very difficult of access, but after patient and careful manipulation all the canals were thoroughly filled. After bleeding ceased the canals were freed from moisture by repeated applications of eucalyptol, and wiped out with cotton on a broach, a slight amount of eucalyptol remaining on the canal walls, more in the small than in the large one. A very small, cone-shaped portion of Hill's stopping was placed upon a hot instrument that was small enough to go far into the canal. The cone, already softened by heat, was dipped in the eucalyptol, carried into the canal and worked by a churning motion as far up as possible. Then a fine roughened broach, slightly moistened with eucalyptol, was used to churn the material until no doubt remained that it had reached the end of the canal. The filling was completed with warmed points of Hill's stopping worked in with a hot instrument. In very small canals the first portion must be made thinner or more plastic by the addition of more eucalyptol, but the amount of this should always be as little as will suffice for successful manipulation. This method of root-canal filling is rather slow, and in some cases requires a great deal of time and patience, but it is vastly better than to fill the canal with a thin solution of chloro-percha and thrust into it a cold gutta-percha point. These latter fillings are almost always in an unsatisfactory condition after a few years.

26. R. C. Brophy, Chicago. *Porcelain Work. Baking with Gas and Gasoline, Using His Own Furnace*. Gasoline furnace was used and a number of crowns were successfully baked, which proves that

country practitioners may use porcelain in their practice with success.

27. C. F. Bryant, Chicago. *Continuous Gum Denture*. The teeth were attached to the plate, and their arrangement was very **artistic**. The mixing of porcelain body and applying it to a metal plate was fully demonstrated. One baking was completed when the electric current failed and prevented the finishing of what promised to be an excellent clinic.

28. G. M. Brunson, Joliet. *A Method of Anchoring Screw Posts in Frail Roots and Badly Broken Down Bicuspids and Molars*. The screw is platinoid wire No. 30, with threads so cut as to readily screw into the roots, going about one-third their length. The cavity may now be filled with amalgam to complete restoration, or built up so as to retain a gold crown. We can see many places for the use of this platinoid screw.

29. S. J. Knowles, Chicago. *Porcelain Inlay (Wassall's Method)*. This was an exceedingly fine clinic. Specimens were mounted to show the progressive steps in the completion of the process. After a cavity is prepared for an inlay the bite is taken in modeling compound to be used as a guide in contour and occlusion. The cavity is then dried and thoroughly rubbed with talcum powder. A stiff copper matrix, as heavy as the case will allow, is adjusted and an impression of the cavity taken in cement, considerable pressure being used. The impression is easily removed by first taking off the matrix. The modeling compound bite is poured in plaster and the impression invested in plaster to support any frail extensions of cement. When the plaster is hard the impression is trimmed so that it will show but little more than the margins of the cavity. The impression is then rubbed thoroughly with talcum powder, and cement is mixed rather thick for a top or model of cavity. Care should be taken to have sufficient bulk of cement to prevent the model from fracturing from subsequent swaging. The reproduction of the cavity is next invested with plaster in a small round tray, called the "bed plate" in Brewster's new inlay swaging outfit. The model, which is an exact reproduction in cement of the cavity, is now ready for the process of swaging the matrix. Platinum foil 1-1,000 inch thick is thoroughly annealed, placed over the model of cavity and partly burnished to place. It is then put in the Brewster inlay swager, cotton being placed between matrix and swager, and an-

nealed and swaged the second time without the use of cotton. The matrix is then removed and trimmed. It is annealed again and then forced perfectly to place by the rubber water bag plunger of swager. It is then ready for baking, and three or four bakings are necessary. To prevent shrinkage, a piece of porcelain tooth is ground to exactly fit from one margin to the other and the foundation body is fused around it. After each baking the inlay can be placed in swager and pressure be brought on it so that there is no chance for it to change shape through shrinkage.

30. F. B. Noyes, Chicago. *Test of Amalgams for Shrinkage or Expansion.* Twelve fillings were made by eleven men, but because of their inexperience in making fillings in the test tubes the measurements of some fillings could not be taken, the contact disc being loose and moving under the micrometer point. Only four alloys were represented, namely, Fellowship, True Dentalloy, 20th Century and Rego. The microscope could detect no movement in any of the fillings. The micrometer recorded an expansion of from $\frac{1}{2}$ to 2-10,000 of an inch for Fellowship alloy, $1\frac{1}{2}$ and 2-10,000 for True Dentalloy, 2-10,000 for 20th Century and $\frac{1}{2}$ of 1-10,000 for Rego. One filling was made of Rego, one of 20th Century, two of True Dentalloy and eight of Fellowship.

31. G. D. Sitherwood, Bloomington. *Treating and Wiring Loose Teeth.* Case of six inferior anterior teeth very loose from calcific deposits. All deposits were thoroughly removed and gums treated; the teeth were then ligated with No. 26 to 30 gauge soft annealed brass wire, the ends of which were turned in between the teeth. When operation was completed the teeth were quite firm.

32. Grafton Munroe, Springfield. Dr. Munroe exhibited some models showing his method of taking impressions for crowns and bridgework; also a case of orthodontia, in which he has attained excellent results. At the start the teeth in both jaws were very irregular, the inferior cuspids standing outside the arch. The Doctor has succeeded admirably in the regulation of both jaws, and has made a wonderful improvement in the appearance of the child.

33. F. H. Skinner, Chicago. *The Preparation of Sensitive Cavities, Using Nitrous Oxid with Hurd's Inhaler, and Gold Filling.* The patient was partially anesthetized and a large linguo-occlusal cavity in inferior right second molar prepared. Patient stated that at no time during the preparation did he experience any pain. The

cavity was then filled with non-cohesive gold and tin to prevent thermal changes, and the filling was finished with cohesive foil. The margins of the filling were perfect, and the finish and occlusion were good. Dr. Skinner also successfully extracted six teeth, using the Hurd inhaler.

34. Geo. C. Appel, Chicago. *Gold Filling*. Clinician unavoidably absent.

35. J. E. Nyman, Chicago. *30th Century Filling*. Upon arriving at Springfield Dr. Nyman discovered that he was still living in the 20th Century, and consequently postponed his clinic for 1,000 years.

36. Lester Bryant, Chicago. *Construction and Shading of Porcelain Inlays*. This was a table clinic, in which Dr. Bryant showed great familiarity with the working of porcelains.

37. R. N. Laurance, Lincoln. *The Use of Flexible Rubber as a Lining for Lower Dentures*. The process consists in so investing the case that the model will be the thickness of a sheet of rubber below the surface of the plaster in the lower half of the flask. The model is coated with flexible rubber dissolved in chloroform, a sheet of flexible rubber cut to pattern is attached to the model, and a piece of cloth used on sheet rubber, boiled out so as to eliminate the starch, is placed on the lower half of flask. Pack the upper half of flask with ordinary rubber, place flask together, and screw down in the usual way. When sufficient rubber to fill space perfectly is evident, remove cloth, close flask and vulcanize.

38. J. E. Elmer, Bloomington. *Gold Filling Restoration*. Cavity in right superior central extending across the tooth and involving about one-third of distal surface over to the mesio-incisal angle. Cavity was carefully prepared and filled with gold condensed with hand and automatic mallet. Margins good and filling well finished, but appeared a little short at the disto-incisal angle.

39. J. N. Crouse, Chicago, Prepared a Disto-Occlusal Cavity in an Inferior Left First Bicuspid, and Filled With Fellowship Cement.

M. L. Hanaford, Rockford, exhibited a filling inserted two years ago for Dr. Backus on the distal surface of superior left cuspid. The filling was in excellent condition.

J. E. Nyman, Chicago, exhibited a porcelain crown placed in the mouth of Dr. Sowle three years ago. The crown looked well and the gingival margins of the gums were in a healthy condition.

R. B. Tuller, Chicago, exhibited an instrument of his own invention, with two small rubber caps for the compression of cocain and carrying medicines to cavities. It is a very handy little device.

R. J. Cruise, Chicago, exhibited an extracting instrument that was used before the turnkey. It was quite a curiosity.

ANATOMY, PATHOLOGY AND SURGERY—REPORT OF SECTION V.

BY THOMAS FILLEBROWN, D.D.S., CHAIRMAN, BOSTON. READ BEFORE
THE NATIONAL DENTAL ASSOCIATION, AT NIAGARA FALLS,
JULY 28-31, 1902.

The discoveries during the past year in the branches of Anatomy, Pathology and Surgery do not bring marked addition to our knowledge, but the discussions upon these subjects show a decided advance toward a better understanding of many problems, and give promise of determining satisfactorily in the not distant future many of the points that have long baffled explanation. It will be impossible in the space and time which I can be permitted to occupy to give anything but the merest outline of only a part of the work upon these subjects.

The only definitely new discovery is of an additional bone in the foot, by Professor Thomas Dwight, which he has found in a sufficient number of cases to entitle it, he thinks, to a permanent place in the list of normal bones of the foot.

Dr. David Riesman and Dr. A. O. J. Kelley have contributed a valuable article on the relation of bacteriology and pathology. One of their interesting statements is that aseptic wounds are rarely sterile—of forty-three cases examined but eleven were found so. *Staphylococcus pyogenes albus* was commonly the infecting agent. The greatest number were found on the second day of healing. They believe that "aseptic fever" is due to the absorption of organic materials and the products of bacterial metabolism from the wound.

They seem to credit the statement that carcinoma is increasing, and quote from the report of the Committee of the British Medical Association that the physical conditions where carcinoma prevails are contamination of the soil with sewage, and general lack of drainage. Evidence is adduced that there is a special tendency to the occurrence of malignant disease in certain houses and groups of houses, and on

the whole carcioma is reported to be more prevalent in old houses and districts than in new ones. (*Year Book of Medicine and Surgery.*)

Dr. James Ewing has made some valuable contributions to the pathological anatomy of malarial fever, showing the effect of the disease on the various organs of the body. No member escapes its baneful influence. His account of its destructive effect upon the marrow is interesting from a dental view. Cellular hyperplasia is pronounced, the nucleated red cells are abundant and lymphocytes are overabundant, while fat cells are atrophic. The blood shows anemia of the chlorotic type, with a marked tendency to develop the signs of pernicious anemia. The condition has, of course, a depressing effect upon the osseous support of the teeth and must be recognized as one efficient cause of the atrophy of the alveolar walls. (*Journal of Experimental Medicine.*)

Dr. A. Michel finds that the saliva has a great influence on caries of the teeth, and that the quality of the drinking water influences the composition of the saliva. He finds that the water of Wurzburg has fifty times as much calcium oxid as that of Lohr, and the calcium oxid of saliva taken from the inhabitants of Lohr is only one-sixth that found in the saliva of the inhabitants of Wurzburg. Dr. Michel came to the conclusion that where a lessening of caries is found there is an increase in the amount of sulphocyanic acid and an increase in the alkalinity of the saliva.

The second annual report of the Cancer Committee of the surgical department of the Harvard Medical School was presented in February, 1902. The Committee is making systematic efforts to fix definitely the cause of cancer. The great diversity of opinion in regard to it makes the task a laborious one. These differences are emphasized by the fact that of eminent scientists twenty-seven believe in the contagiousness of the disease, eight believe that it is not contagious, sixteen believe that bodies found in cancer are degenerate epithelial cells, while eleven believe that these bodies are parasites. So we must wait a little while for a solution of the question.

Dr. Miller discusses the presence of bacterial plaques on the surface of the teeth. He denies that a film on the surface of a carious surface can be taken as evidence that the film gives rise to the caries. Three jaws which he examined did not show a trace of tooth caries, yet all revealed a normal extension of the film when stained with

eosin, and the teeth of his colleague, who is immune to caries, presented as fine a growth of film as one could desire, only the cusps of the teeth being free. Other writers have conceived that caries was bound to follow the presence of a film, under which the bacteria were sure to be present and carry on their destructive process. Dr. Miller thinks that in some cases the film serves as a protection to the tooth instead of a menace. (*Cosmos*, May, 1902.)

W. Arbuthnot Lane offers some new ideas on the form of the alveolar arch. He maintains that besides the presence of the teeth there is an additional factor controlling the development of the upper jaw that does not influence the lower jaw to anything like the same extent when movement of these bones upon one another does not exist. Second, that in a normal skeleton the lower jaw is dependent for its perfect development upon that of the upper jaw. He thinks that respiration has also great influence upon the development of the jaws, and substantiates his position by photographs of children bred under conditions unfavorable to full respiration. (*Clinical Journal*, Vol. XVII.)

Phagedenic pericementitis comes in as usual for discussion during the past year. Dr. Wright has contributed an excellent article which throws considerable light on this much-discussed subject. (*Cosmos*, February, 1902.)

W. Booth Persall, F. R. C. S., in the *Journal of Anatomy and Physiology*, has proposed a new method of comparing the anatomical formation of the teeth by the use of diagrammatic outlines instead of drawings. He thinks his method produces more accurate results, and his arguments make the scheme more desirable.

A new method of administering electricity for local anesthesia has been suggested. M. Regnier, head of the laboratory of electrotherapy of the Charity Hospital, and M. Dydsbury, of Paris, describe it in *La Nature*. The operation is the placing of a simple conductor (using an arrangement of M. GaiFFE) in connection with an electrode to be applied to the region to be anesthetized. Thus far the experiments have mainly been tried in the operations of dentistry. An account submitted to the French Academy of Sciences says that in fourteen cases of extraction of monoradicular teeth thirteen cases of complete insensibility and one of relative insensibility were produced, the current in the one instance having been applied only thirty seconds. But although the method is so new, there are already indi-

cations that it will soon be applicable in the most severe operations of surgery. M. Billenkin, a surgeon at Epernay, reports that he has been able to use electricity in cases that up to this time have required the employment of chloroform. He mentions an operation which was performed without any pain to the patient, involving the removal of a large hemorrhoidal mass.

Dr. Joseph Head has contributed an article on a method of bleaching the enamel of teeth with living pulps. He isolates the tooth with rubber dam, applies pyrozone, and while the tooth is still wet applies an instrument as hot as the patient can readily bear. This, he contends, drives in the steam from the hot instrument and also liberates the nascent oxygen that is in the enamel. The true value of this can be determined only by repeated experiments. (*Items of Interest.*)

An interesting and perhaps the most important contribution of the past year is furnished by E. C. Kirk, on the Chemical and Clinical Study of Erosion. He states that he believes dental erosion is a constitutional disorder with a local manifestation, and that it presents two types. He also states that he has demonstrated the cause of one type of erosion to be lactic acid, and of the other type to be exudation of acid sodium phosphate. The first type is due to fermentative processes in the mouth, and the second to a disordered condition of certain buccal mucus glands. The article is worthy of not only a reading but of careful study. (*Items of Interest.*)

PRESIDENT'S ADDRESS.

BY J. A. LIBBEY, D.D.S., PITTSBURG. READ BEFORE THE NATIONAL DENTAL ASSOCIATION, AT NIAGARA FALLS, JULY 28-31, 1902.

There have been various attempts to mark by some distinguishing title the character of our age. Its tremendous commercial and manufacturing energy; its wonderful discoveries, especially along the line of electricity—the brilliant adaptation of this force to practical life—have seemed appropriately to designate the age. But we are proud to be able to choose a still stronger designation, and call it the age of remarkable increasing benevolence. The gifts in behalf of education, amounting each year to many millions, have become to us a commonplace subject of felicitation; while they excite the wonder and are beginning to stimulate the same spirit in other people. But it may be well for us to ask ourselves whether it is not part of our responsibil-

ity to direct somewhat the current of this noble giving, so that some of its power and blessings shall flow into our work. We sympathize with every effort to develop universities and the opportunities for technical and manual training; we rejoice in all that instructs brain and hand; but we shall rightly ask for a place, remembering how greatly our profession needs increased facilities and the advantage of these opportunities to hasten a progress greater than that of the past. Ministering as it does to the health and happiness of the community, our profession has an unselfish platform from which to appeal for our share in these generous gifts. If we are to fully develop our science; if we are to train students who will make fresh discoveries and increase in skill—who will be able to give to suffering thousands the results of a science completely mastered, we must have a more perfect education.

The proposed lengthening of the course of study is at once an evidence of our desire to send out more skillful practitioners and unite our larger skill to the great needs of suffering humanity. I allude particularly to the National University, the Polytechnic School of Pittsburg, the prospects of enlarged university facilities, and the Evans' fund. I recommend that a committee be appointed to look after the interests of our profession in this matter. The New York State Dental Society has taken the initiative step, and this Association should give all the assistance it can. It seems to me it would be better to do this work in the name of the National Dental Association, giving the New York Society due credit and a representation on the committee.

The National Dental Association is a delegate body representing the organized dental profession of this nation, and being a delegate body, its work is for the benefit of the whole organized body of dentists. Its membership is not merely the few who come as delegates and bear the burden of the work and expense, but every member of a state or local society which is represented by a delegate is in the same relation to this Association as every citizen is to our government. A citizen is a supporter of the government—this country is governed by representatives elected by the people, and the same rule should prevail in this Association. Our work is for the advancement of the whole profession and should be supported by it, instead of the burden falling exclusively upon those who devote their time, energy and talents to the work. It is the duty of every society represented

in the National Dental Association to acknowledge its allegiance to it by contributing to its support. If every society would pay the small tax of one dollar for every delegate to whom it is entitled, it would increase the fund in the treasury to such an extent that this Association could accomplish vastly more than is possible under the present plans. We could encourage investigation to a greater extent, we could print our own journal, and place it in the hands of the members immediately, all the journals having the same opportunity of using any of the material they wish, instead of making a privileged journal, and having transactions come to the members as evidence of something that has gone before. As the permanent membership increases it is losing its identity as a delegate body and assuming an individuality—merely a society—and as such its influence with the organized profession will decrease. Let us maintain the representative character so ably advocated by Dr. Black in his address last year.

Legislation. One more state, Ohio, has by an act of legislature joined the ranks of those requiring examination for license. I regret they were unable to place the nominative or selective power with the state society (as no one is as competent to select examiners to conduct a professional examination as members of that profession who take an active interest therein); also, the placing of examination papers on file in the State Department. The discretionary feature is a good one if it is so guarded that abuse of that power cannot result.

In Pennsylvania the five schools and the state board of examiners have always worked in harmony. Since the establishment of the law of 1897, requiring examinations of all in possession of a diploma, and desiring a license to practice in the state, they are working together to improve the conditions from an educational standpoint, and the results have been a marked improvement in the personnel of the students, as well as in their training in the different branches. Quite a rivalry seems to exist among the schools to have their students make the best average in the examinations, and with this spirit extant good results must necessarily follow. All possible safeguards must be adopted to secure perfect fairness in examinations, if such commendable rivalry is to be maintained, instead of competition on lower planes.

The state supervision of dental education and the licensing of practitioners in Pennsylvania are greatly safeguarded through the work

of the Dental Council, a body composed of the State Superintendent of Public Instruction, the President of the State Board of Health, the Secretary of Internal Affairs, and the President, for the time being, of the Pennsylvania State Dental Society. The Council passes upon the credentials of the applicant, including the matriculation requirements which have been recorded by the Superintendent of Public Instruction. A card of admission to the examinations is then given to the applicant to present to the board. As soon as the examination is completed a report of the marks on individual branches and the general average, signed by each member of the board, is sent to the Secretary of Internal Affairs, who is also secretary of the Council, and placed on file for five years, subject to public inspection the same as any conveyance of land.

The members of the examining board are nominated by the state society, two for each vacancy, and from these names the Governor shall appoint the required number. They must be members of the state society (which is a representative body of the dental profession of the state), in good standing and have had ten years' practice. There is no act of the board which is not by law open for public inspection. In addition, the State Department issues a report of the work of the board, including the name of the applicant and college, and the marks on each division with the general average. All the questions are likewise submitted, but in case of failure the name of the applicant is withheld.

The licenses are issued by the Council, signed by its President, the Superintendent of Public Instruction, the Secretary of Internal Affairs, and by each member of the Board of Examiners; therefore the examiners are a part of the educational system, and not, as frequently alluded to, a committee for enforcement of law. If all the states would adopt a law similar to this there would be no occasion for the criminal charges brought against a member of a state board last year.

I have taken the liberty to call your attention to the Pennsylvania law because its enactment was the culmination of ripe consideration of the principles which the dental profession of that state felt should govern our standards of education. Five years' experience in its practical operation has demonstrated that it is founded in equity to all concerned; hence it has been productive of a better class of licenses by eliminating the unfit, and has enlisted the harmonious and cordial support of the teaching institutions of the state.

Recent Publications. We have among recent publications, "Answers to Questions Prescribed by Dental State Boards," by Robert B. Ludy, M. D., Philadelphia, Conover Publishing House. The first sentence of the preface is, "To pass creditable examinations is the laudable ambition of every earnest student. Many persons having an adequate knowledge of the subject in which they are tested fail because of their inability to interpret properly the intents and purposes of the questions to be answered by them." The July *Cosmos* in its bibliographical department expresses my views so clearly that I refer you to it instead of quoting it. The function of the state board is to discover the student's general knowledge of the subject, which it cannot do in an answer of one, two or three sentences. The students who depend on this cramming process will not make high averages. I believe it is our duty to express our views as stated in the article to which I refer, "That we are firmly opposed to the idea which prompts the publication of a work of this character, for the reason that we do not believe it to be subservient to any legitimate educational end."

Honorary Degrees. The New York legislature, in a bill signed March 28, 1901, gave to the Board of Regents authority to exchange the M.D.S. degree for the D.D.S. degree, the former (M.D.S.) being strictly a local degree conferred by the Dental Society of the State of New York, and the said Board of Regents at its annual meeting, July 1, 1901, declined to exercise the power conferred by the act quoted and referred the subject to the Dental Society of the State of New York for a definite report on the matter. The National Association of Dental Faculties at its meeting last year tendered a vote of thanks to the Board of Regents for its action, accompanied by a protest against any attempt to confer honorary degrees. At the last meeting of the Dental Society of the State of New York the act of assembly conferring this questionable power upon the Regents was approved by a large majority. Standing Resolution No. 6 of this Association, which is in force at this time, is as follows—"Resolved, That this Association believes the conferring of honorary degrees in dentistry to be detrimental to the profession of dentistry, and hereby expresses its disapprobation of the practice." It would seem to be the duty of this Association, representing the organized dental profession of the nation, to give an expression of opinion upon this matter.

Dental Surgeons' Corps, U. S. A. The Surgeon General of the Army, in answer to my request, informed me that he had made application to the War Department that Dental Surgeon John Hess of West Point (one of the Examiners of the Army Dental Corps) be detailed to attend this meeting as its representative. I suggest that he be requested to give us some information as to what is being accomplished by the Corps. I have received letters from different members of the Corps, giving in detail their method of procedure in examinations, operations, etc., as well as the amount of work accomplished; all of which shows the wisdom of the Department in establishing a Dental Corps in the Army.

The Committee on Army and Navy Legislation have been engaged in active work with the view of establishing a commissioned Dental Surgeons' Corps in the Navy, and making the Army Corps a commissioned instead of a contract Corps. While they have not met with the success hoped for, they are sanguine of success in the near future, the question of rank being the principal stumbling block. This Committee should be continued and instructed as to the rank for which they should contend.

The relation of dentistry to the defensive arm of the National Government is in reality but one aspect of that still broader problem of the relation of our profession to the public health. The subject is as yet in its infancy, notwithstanding the fact that much thought and labor have been expended upon it, especially in a few European countries. Our rate of progress in this department of our profession is at present comparatively slow, mainly because of the lack of a ripened public sentiment necessary to the support of our efforts in that direction. That sentiment must be created, and it would seem that the intention of the thoughtful public could be best directed to the matter by an authoritative presentation of the existing need of intelligent dental care as a health measure. Such presentation to be effective must be based upon an exhibit of the conditions which result from the impairment of the teeth and diseases of the oral cavity due to ignorance and neglect, and this Association should take such steps as it may deem wise and effective to secure statistical data upon which may be based conclusions worthy of general dissemination, with a view to not only correcting existing evils, but of demonstrating the vital importance of our ministrations to the public health.

The International Dental Federation. The International Dental

Federation and International Commission of Dental Education will convene at Stockholm on August 12. The questions to be discussed by the International Commission of Dental Education as published by its officers are—1. What preliminary knowledge is necessary for the dental student? 2. What part of the medical and scientific subjects should be taken up, and at what time of the period of training should the study of them be pursued? 3. What is the importance of the theoretical technical knowledge? 4. What is the importance of the practical technical knowledge? 5. What are the most appropriate names for the several titles now used throughout the world? The Federation will consider these essential points in aiming to establish a harmonious educational system throughout the countries of the world.

The purposes and aims of the International Dental Federation have become sufficiently familiar to the dental profession of the world through the publication of its proceedings in our periodical literature during the past year. It is therefore unnecessary for me to refer in detail to the work of that organization. I deem it, however, to be my duty as well as my pleasure to speak in terms of high commendation of the purposes of the organization, and the spirit of international fraternalism of which it is the exponent. The progress of civilization which has placed at our command the means of annihilating time and space has in the same degree brought the nations of the earth into closer relationship, and the proximity has tended to remove suspicion and antagonism as it has engendered mutual regard and respect.

The world's profession of dentistry has not escaped this civilizing influence, and the International Dental Federation is the crystallization of an effort to unify and harmonize the best elements of dentistry among all the nations of the earth upon a higher plane of endeavor, to the end that our effort toward the betterment of our profession and of humanity may be enhanced. I would therefore recommend that our delegates appointed to represent this Association at the Stockholm meeting be instructed to convey the greetings and the assurances of the sympathetic cooperation of the American dental profession to the International Dental Federation in its noble work.

Forty-three years ago the preliminary meeting for organizing a National Association was held in this place. How well that work was done has been demonstrated by the progress that has been made

along all the lines of our profession. Few of the organizers are left, but their work will go on and they will live in our professional history as those who planted that their children might reap. They sowed the seed, we are reaping the harvest. Let us always keep alive the same professional spirit, cultivating the soil in which they labored, so that those who come after us may enjoy the larger fruits of our endeavor.

GALVANISM, GOLD, AMALGAM, AND THE HAHNE-MANIAN THEORY.

BY R. C. GRANT, M.D. READ BEFORE THE ROCHESTER DENTAL SOCIETY,
APRIL 8, 1902.

It seems to me the great mistake has been made by the gentlemen of your profession arraying themselves irrevocably on one side or the other, for or against amalgam fillings; seeing on the one hand nothing that was bad or dangerous in them, and on the other nothing but harm and suffering from their use. I do not suppose there are many to-day who would attempt to deny that a galvanic current may be and generally is produced where there are metallic fillings of different kinds in a mouth; that is, if a gold filling be placed in a mouth with amalgam fillings, the saliva acts as the exciting fluid and galvanic action occurs. If the secretions have become acid from decomposition of any particles of food that have adhered to the teeth this galvanic current is greatly increased, but even in the normal alkaline secretions it is readily detected.

Up to a certain point galvanism may produce a beneficial effect, and by its stimulating property actually assist tissue growth or building, but if long continued the inevitable reaction, which pervades the whole domain of drug action, is sure to set in, and hyperesthesia and tissue degeneration occur, and we have that most deplorable of all patients, the neurasthenic. The galvanic current produced by the presence of gold and amalgam fillings in the same mouth may not be of sufficient intensity to produce this effect in all or in many cases, but those who are susceptible to this kind of action will surely be affected, and the greater the susceptibility the more pronounced and lasting will be the symptoms. Then there is another effect which is easily produced by galvanism in the mouth that is still more serious. One of the commonest elements found in the mouth is salt or sodium

chlorid. This chemical combination is broken up by the electric current, and the chlorin may form with the mercury of the amalgam chlorid of mercury, which is one of the most active forms of mercury known, and is a drug that has a cumulative effect in the system, so that the most minute quantity if repeatedly (not to say constantly) absorbed into the organism will be almost sure to exert in time a profound systemic poisoning. Then where there is a wearing surface of any size and number of amalgam fillings there must be some minute quantity of the metal worn away, and, of course, absorbed by the system. Now do not imagine that I am insensible to the infinitesimal amount that this would be, but I mean to show later that the quantity has actually little to do with the effect produced; simply the susceptibility of the patient to the drug.

Let me say here, that the stock arguments against the theory of mercurial poisoning from amalgam and red rubber in the mouth are weak and unscientific. First. It is said that there is only occasionally a man who fancies he sees these dire effects, where there are hundreds who do not. In answer I will say, that the failure of any number of men through carelessness, lack of observation, or lack of opportunity to observe, to see these effects does not negative the facts that are seen and understood by even one honest observer.

Second. Salivation being a known symptom of mercurial poisoning, it is held to be a test, and the absence of salivation is a conclusive argument with these gentlemen that no mercurial absorption has taken place. Now be it known that salivation is only one symptom, which may or may not be present, and is shown only in the poisoning by crude doses, except here and there a case where the patient is most susceptible to the action of mercury.

Third. It is claimed by the critics that the symptoms reported are scarcely alike in any two cases, and are often at variance with the toxicological effect of mercury. Especially was this argument used by the editor of a dental journal in criticism of some cases reported by Dr. Tuthill of Brooklyn. I took the pains to compare the symptoms of those cases with the homeopathic provings of mercury, and found the pathogenesis of the drug to cover very nearly every symptom that he reported. Furthermore, in poisoning by minute doses of any drug the symptoms produced will be modified by the idiosyncrasies of the patient, and no two victims will show the same set of symptoms.

I have referred repeatedly to the susceptibility of patients to drug action. This is a well known and indisputable fact, and it is a further fact that one individual may resist disease action or drug action perfectly at one time and under certain conditions, and at another time, or under other circumstances, will succumb to the action of the same disease or to the same drug. It seems unnecessary to cite instances of extreme susceptibility, such as a well authenticated case of a lady who would become nauseated by even holding a bottle of ipecacuanha in the hand, experiments being tried in various ways and times to try to fool her, but in vain. We all know of people who will show violent symptoms of poisoning by being brought into near proximity to poison ivy, without in any way coming in contact with it except the emanations conveyed through the atmosphere.

Perhaps all of us have had cases of neurasthenia due to either galvanism or mercurial poisoning, that we relieved with more or less dispatch, and never realized the cause, for it is well known that if such patients relapse they are more likely to go to a new physician than back to the old one. Again there are others who may have been convinced in their own minds that the cause of the suffering was the fillings in the teeth, but who could not bring conviction to the mind of the patient with sufficient force to induce him to have the fillings removed, and so to prove or disprove the diagnosis.

Doubtless the methods of "proving" drugs and recording symptoms for the building up of the homeopathic materia medica is familiar to you all. Suffice it to say, that the homeopathist knows nothing of the value of a drug for therapeutic use except as he has learned of its action upon people in health. In order to get at the whole pathogenesis of a drug many provings are made on scores of observers, using doses ranging from the largest that can be borne by the system without fatal effect to the most minute doses possible to conceive, and it is an incontrovertable fact that the smallest doses will always bring out the greatest number of symptoms and the subtlest effects. This is a fact that has been observed by all of the best men of our school of medicine for the past hundred years, and it is not in dispute.

This, then, will account for the great variety of symptoms, and the lack of the grosser or cruder ones, in the cases of mercurial poisoning that have been so frequently reported by dentists and physicians. It is generally conceded by the masters in homeopathic materia

medica that comparatively few people make good provers because of their lack of susceptibility to or observance of the symptoms produced by any except the crudest doses. I leave you to make the application of this fact to the question in hand.

Personally I have observed but few cases where I felt sure the mercury in the mouth was very harmful to the patient, but I have observed repeatedly the peculiar mercury tongue—broad, flabby, with indented edges, from the imprint of the teeth—in patients with amalgam fillings, and if this is a fact there are doubtless many other conditions which I should have attributed to this cause. In my own case I suffered for years with bleeding gums, which symptom disappeared on the removal of the amalgam fillings. There is a physician in the Hahnemann Society who had a case of typical skin disease which failed to yield to any other treatment, but got well after the removal of amalgam fillings from the teeth. But cases of this kind have been reported so frequently that it is unnecessary to multiply instances and unfair to deny their existence.

To sum up, if my postulates are accepted the deductions would be that there may be and frequently are patients who cannot bear amalgam fillings without great mental and physical sufferings; that there are many who carry them with impunity because of their lack of susceptibility; that no man can possibly tell before trial who can and who can not bear them; that it is far better where gold or bone fillings can be employed to never use the amalgam; but in those cases where nothing else will answer, either from the condition of the teeth or the financial aspect of the question, and amalgam is used, to be open-minded and fair, and ready to acknowledge the deleterious effects of the same upon the system, if they should unfortunately appear, and remove the offending substance gracefully, graciously and without excuse or apology.

Discussion. Dr. C. H. Nicholson read the following letter from *Dr. S. B. Palmer*: Gentlemen of the Rochester Dental Society: It will be impossible for me to meet with you this evening. Not knowing the views that Dr. Grant may present, I cannot intelligently discuss his paper, so will give my own methods of practice, with the reasons therefor. The greatest trouble with amalgam fillings is occasioned by the galvanic action upon the exposed surfaces of the filling and those in contact with the dentin. Unlike single metals, such as gold, tin, lead, etc., amalgam is composed of an alloy and mer-

cury. That is, the alloy is united or soldered by mercury, and presents minute elements both positive and negative. For this reason amalgam fillings are never bright when in contact with the dentin, unless heavy varnish has been used before the plug was inserted. Here we see a lesson relating to two conditions—one concerning the dentin, and the other the quality of the alloy. Oxidation tends to increase the size of the plug as rust does iron. Normal dentin furnishes less moisture to increase circulation or chemical action, and the density of the dentin confines the oxid, so amalgam fillings become cemented to the walls of the cavity. To increase oxidation copper is used in alloys, giving better results in poorly calcified teeth, such as the deciduous set and the first molars. I rarely use copper in an alloy, but depend upon varnish as cement. The latter is best for devitalized and badly decayed teeth, because it prevents galvanic action upon the surface of the plug, and at the same time fills the tubuli better than the oxid.

The next point to be considered is the location of amalgam fillings, either in conjunction with gold, or even with a filling of the same material. Not only when the plugs are in absolute contact in the same tooth or cavity, but in approximate cavities which represent two distinct conditions. It is safe and good practice to use gold and amalgam in conjunction, that is, to add amalgam to an old gold filling or vice versa, or to use amalgam for a guard filling at the gingival border. The effect is to oxidize the amalgam to such an extent that the local elements as already mentioned, consisting of alloy and mercury, are obliterated. The amalgam surface is always black and smooth where exposed. In short, the positive plate in the battery becomes polarized and no current passes into the dentin. This is not so with approximate fillings, for after every precaution has been taken to avoid it, a galvanic current will be generated where a gold and amalgam filling are in close proximity.

The following authoritative statement gives the amperage, or force of currents between the plates, relative to the distance of their separation—"The quantity of electricity traversing an acid solution of uniform strength varies inversely as the square root of the distance between the plates. The distance varying from four to one, the current will be as one to two. Thus it will be seen that very small exciting surfaces may produce vigorous chemical action when the distance between them is but trifling."

The most marked disturbances are noticed when a tooth thus filled has approached its approximate, until in mastication or on becoming loosened the two fillings come in contact. Thus there is established a "make-and-break" current. The amalgam is the positive element from which the current enters into the gold. Should the dentin under the gold prove a conductor the pulp manifests the presence of a circuit. The remedy is to remove the most objectionable filling and replace with gutta-percha, perhaps temporarily. When both fillings can be made with gold all will be well. Some of our younger members may learn by experience that when a fresh amalgam filling is placed adjacent to one of years' standing, like effects upon the pulps are produced, though in less severe form.

I have had two cases for removal of fillings within a few months from the cause already mentioned. All new amalgam fillings undergo vigorous electric excitement from galvanic action occasioned by the elements of alloy and mercury. This excitement subsides when the surface by oxidation blends or polarizes the elements. At first an amalgam plug is in much the same condition as a filling of zinc would be, and we all know that a zinc plug would not be tolerated. It is well to use heavy varnish, or cement upon a coating of thin varnish, before inserting the filling.

The next disturbance is doubtless familiar to all, namely, that caused by amalgam fillings coming in contact with gold crowns, especially when the latter are used as a support for a bridge. One case will illustrate the principle. About five years ago a man consulted me regarding alarming symptoms supposed to arise from facial neuralgia, which extended to the shoulder and down the arm. An examination showed the cause to be an amalgam filling in the superior third molar. The second molar was capped with gold and supported a bridge carrying three or four crowns. Wedging was necessary to make the filling accessible, so a thin, wide strip of rubber was drawn between the filling and crown and the patient instructed to return the next day. A cure was effected over night by the separation. The amalgam filling was removed and gutta-percha inserted, and no further trouble has ensued. In this case I do not hold the amalgam responsible for any pathological influence, other than an element that aided in generating an electric current. Two other cases have been relieved. The first, incipient deafness, was due to a second molar which seemed too remote to be considered. It had

been filled with amalgam many years before. Removal of the filling showed the pulp chamber to be full of odorous septic matter. The tooth was treated, refilled, and hearing was restored. The second case presented symptoms of paralysis of neck and shoulder. About the same conditions existed, and the same line of treatment was carried out. The tooth is still giving service and there is no more paralysis.

I am convinced that some patients are more susceptible to mercurial influences than the profession realize. Before drawing conclusions I always consider well the objection to amalgam as given by the patient. I remove amalgam fillings occasionally for the possible benefit of a patient, and generally find it the right thing to do. Complaint of a metallic taste in the mouth by patients who have amalgam fillings leads me to remove all the possible causes of such taste. While I am not prepared to believe as fully in the theory of Hahnemann as a late friend of mine, who believed that if mercury were hermetically sealed in a glass tube and carried in the pocket it would affect the individual, there are grounds for believing that amalgam causes more injuries than general practitioners credit.

Discussion. *Dr. F. W. Proseus, Rochester:* There is one thing upon which we all agree, and that is that amalgam does in some patients and under some circumstances give rise to widely varying troublesome symptoms. From my own experience, if two different metals are in a mouth I am certain that a galvanic current is set up which might affect the health, beside tending toward the destruction of the fillings themselves and the dentin where in contact with the fillings. I had a patient who complained of a constant metallic taste in her mouth, and pericementitis. Dr. C., a homeopathic physician, told the lady that the trouble was caused by the presence of amalgam fillings in her teeth. I objected to removing the fillings, but finally did replace the larger ones with gold, and the metallic taste and other trouble immediately ceased. Dr. C. charged the trouble to the mercury, overlooking the galvanic action. Another case was a gentleman who had recently had a bridge inserted. There was a very old amalgam filling in one tooth, and his teeth became so sore that he could not bring them together. The filling was replaced with red gutta-percha and the soreness disappeared. A somewhat similar case was reported at the Columbian Dental Congress.

Dentists recognize that these troubles do occur, and as the homeo-

pathic school teaches that if you get an action from a drug when a large dose is administered, it will also produce an effect if the dose is small, we must allow that if gold and amalgam are present in the same mouth there will be galvanic action which will eliminate a certain amount of mercury. In many cases sufficient will be set free to constitute the homeopathic dose. Dr. Palmer says that a new amalgam filling will cause more of this galvanic action while it is bright and clean than after it becomes tarnished. For this reason it would probably be safer to use an amalgam that will tarnish quickly and thus limit this action. Dr. Palmer has been studying amalgams for forty years and his experience should be received with respect. I think we will have to admit that such results are possible, and when we receive complaints from homeopathic physicians we should treat them courteously and remove the fillings.

Dr. J. H. Beebe, Rochester: Many present remember the antipathy to amalgam which my old partner, Dr. Walter, had for so many years. The origin of his feeling arose in this way. He was doing some work for a homeopathic physician who, observing him cough frequently, pronounced it an amalgam cough and told him to remove the amalgam fillings from his mouth and he would be rid of it. The fillings were removed and the cough left him. After that he used no more amalgam in his practice. The difference is in the people. Some will be affected by the presence of amalgam and others will not, and no one can tell until it is proven, who will feel it.

Let me read an extract from a letter from Dr. Barrett to Dr. Walter, written in 1888—"You ask me why certain effects of mercury are sometimes seen in patients. Mercury is, with few exceptions, the most powerful of the metallic poisons. Its toxicological possibilities are wonderful. Combinations with other substances develop characteristics that are amazing. Analogous combinations develop the most diverse substances. For instance, mercurous chlorid ($\text{Hg}_2 \text{Cl}_2$) is calomel, which is largely used as a medicine and is a very effective cathartic. Mercuric chlorid (Hg Cl_2) is corrosive sublimate, a poison so virulent that it has given its name to a whole class of toxicological agents. Now there is only this difference between the two substances—one proportion of mercury. In the mouth we meet with all manner of substances that are under the most favorable conditions for uniting with the mercury if it is present. The combinations of mercury are very unstable, and under the influence of heat, any free

mercury especially is readily sublimated. So here we have, if mercury be present in the mouth, all the conditions that *might* form deleterious compounds. That free mercury is inert, as has been frequently asserted, is not so, for we all know what are the dangers to which workers in mercury, especially in the mines, are liable. Some persons are exceptionally sensitive to the action of mercury as some are to every poisonous article. Some will handle Rhus Tox (Poison Ivy) without harm, others are violently affected by the merest contact. About the use of mercury in the mouth, I believe it is too powerful an agent to be used without the most extreme care. Most persons will not be affected by a moderate amount of amalgam fillings, while others cannot bear even one such filling. It may be used in moderate amount in most cases, but the dentist should exercise care. Its effects, so far as I am aware, are constitutional and not very often local. It produces its characteristic periosteal effects in the mouth and upon the mucous membrane. You know what they are. There may be cases where it produces local irritation and soreness, but I have never seen one in which the difficulty could not properly be attributed to something else. Pharyngeal and laryngeal complications are quite possible. I have under treatment now a patient the most of whose teeth are well filled with gold, but in some difficult locations amalgam was inserted. In every one of the teeth so filled there is periosteal trouble and there has been ever since they were so filled. Periosteal difficulty about the roots of the teeth in mouths in which there is a great deal of amalgam is often seen, as indicated by painless swellings of a hard character opposite the roots (indurations) which gradually increase, and unless the amalgam is removed will result in necrosis. You may ask why I ever use it. Chloroform and other anesthetics are useful in their way, but I would not use them indiscriminately to every one without examination. Chloroform and amalgam are both of great service if judiciously employed, but either is capable of great mischief if given to the wrong person."

Extract from a letter from one of Dr. Walter's patients—"I thank you for the comfort I now have. You may remember my mentioning that in winter time I was troubled with eczema in the calf of my leg. Since the extraction of the soft fillings it has entirely disappeared."

Dr. Walter once said, "One of the most remarkable cases of mercurial action, not on the system, but on gold placed in close contiguity to a large amalgam filling, was that seen in the mouth of

C. M. W. I placed a gold crown on a second lower right bicuspid, said crown being simply rolled from an English crown piece, consequently 22K fine. Immediately in the rear of the crown was a large amalgam filling which composed the crown of the sixth year molar. Six months after the gold crown was set it commenced to turn dark, until it was the color of oxidized silver and nearly as black as the amalgam filling itself. I removed the amalgam and there has been no indication of a return of the color."

Another case: Rev. Dr. R. came to Dr. Walter some time in August, 1888. Had been suffering for years, complained of dizziness and swimming vision. The least excitement caused "a darting up in front of face." Had for five years been unfitted for his profession. He was in the office Dec. 20, 1888, and mentioned voluntarily that he had not been so well in years. He would not say that it was the removal of the five amalgam fillings that had caused his convalescence, but he was certainly better and the mending commenced soon after the fillings were removed. Eyes at the former date had an uncertain and vague expression which had entirely disappeared.

Dr. Walter also had recorded cases of neuralgia, eye and throat trouble, and pimples on the face, which had been cured by the removal of amalgam fillings, the neuralgia in an hour.

Many think because the mercury is closely combined with the other metals in an amalgam that it can have no action on the system. I argued this way with a dentist who told me that at one time a patient, instead of spitting out a number of particles which became detached from an amalgam filling as he was inserting it, swallowed them, and next day had an active diarrhea. The dentist did not believe it was the mercury that affected him, however, but thought it was the irritation set up by the rough and sharp particles of metal. The same amount of sand would not have had the same effect. Amalgam does often have a deleterious effect on the system, and many patients have been benefitted by the removal of fillings. People of exceedingly nervous organisms are peculiarly susceptible.

Dr. W. W. Coon, Alfred: The coloring matter in base plate gutta-percha is red oxid of mercury, a preparation which is much more likely to be harmful than amalgam. Don't you use gutta-percha?

Dr. Beebe: The coloring matter in red base plate gutta-percha is Armenian bole, an earth composed largely of oxid of iron, and even

if it were sulphid of mercury, we would get less mercury than from amalgam.

Dr. Johnson: Dr. Palmer struck the key-note in galvanic action, but failed to note the vital point. The galvanic action breaks up the mercury and forms oxid of mercury, which is a soluble salt and a powerful poison. When the fillings are near each other in the mouth the effect is greater and more apt to affect the patient. I am not a crank on this subject, in fact, I have amalgam fillings in my own mouth, but I have had patients who suffered from their presence, also those who suffered from the wearing of red rubber plates. Some reported cases are hard to credit, such as the cure of a long-standing neuralgia in an hour by the removal of amalgam fillings. To report such a case lays the man open to the suspicion of being a crank, and brings up the idea of suggestive therapeutics, but in the other cases the idea of cure by suggestion was not admissible.

Dr. Haydon: A lady of forty-five came to my office. She was under electro-magnetic treatment and had all the amalgam fillings removed to relieve her of a ringing in the ears, but it did not improve after their removal.

Dr. H. L. Belcher, Buffalo: A friend of mine had a metallic taste in his mouth which was caused by galvanic action between two gold fillings.

Dr. W. W. Belcher, Rochester: If the keynote of the situation is as Dr. Johnson states, that the soluble salt of mercury is released by galvanic action, it would eliminate all fear of danger when there were only amalgam fillings in the mouth. Some people have idiosyncracies, and may be acted upon unfavorably by substances perfectly harmless to the vast majority of mankind. Some cannot eat strawberries, and I know a lady who is made violently ill if she eats the least bit of an apple, although she is exceedingly fond of them. Such persons would have only to look at amalgam to suffer from mercurial poisonings, and the removal of amalgam fillings from their mouths would probably cure them of almost anything.

Dr. G. Goode, Rochester: Mercury in alloys is in a chemical combination and not readily separable. Dr. Black taught us that the change of form in amalgam fillings, always thought to be due to oxidation, was due to flow of the amalgam or what is commonly called "stress." The amalgam is possibly changed by changing the chem-

ical composition of the filling, and this change may drive the mercury to the side of the filling and thus allow of its escape.

Dr. Beebe: Amalgams, as any alloys made by a mixture of two or more metals in definite proportions, are mechanical combinations, but all amalgams are not alike, therefore galvanic action would be produced in a mouth having only amalgam fillings.

Dr. C. H. Nicholson, Rochester: I do not believe amalgam is a chemical compound, but simply a mechanical mixture, and mercury may be freed from it under certain conditions. That galvanic action may change mercury from the metallic state to a salt may be granted, but I do not believe it can be demonstrated, and if it does so, the amount of mercury so thrown into the system would not be sufficient to affect it. Those brought up in the homeopathic school no doubt think so, but the idiosyncrasy of the patient would explain any supposed effect in perhaps every case. I believe in the effect of suggestive therapeutics. A young man came to me with severe neuralgic pains in the side of his face, which he supposed were from a tooth he pointed out, which had an amalgam filling. This filling was removed, but the tooth was found to be in good condition, and the cavity was filled with gutta-percha. The neuralgia left him for a time, but after a few weeks he returned with the same trouble, and this time he thought it was from the next tooth. This was opened up and found to contain a pulp stone. A cure of the neuralgia followed as before, but twice more it returned, and the last time I only pretended to do something to the tooth and discharged the patient. Some time afterwards a hypnotist was giving an exposition, and this same patient was made the subject and proved to be very easily brought under hypnotic influence. At the end of the seance he suddenly had a severe attack of the neuralgia and called to me for help. I told the hypnotist that the man had no toothache or other pain, but thought he had, and asked him to treat him by suggestion. He was thrown into a hypnotic sleep and told that the trouble and pain had left him, and when he awoke he was all right.

Amalgam has been used more than any other filling material, and with most excellent results in saving the teeth and building up the health of the patients, and unless there is a rare case where we know there is an idiosyncrasy against it we should not hesitate to use it.

Dr. M. Rosenberg (M. D.): I do not believe that mercury could produce any poisonous effect in quantities so infinitesimal as would

be derived from amalgam fillings in the mouth. I frequently prescribe mercury and never get the results from much larger doses than are described in these cases. The human system will withstand the action of poisons and eliminate them when in small quantities. The galvanic current theoretically will produce chemical changes, but the current must be used in definite amounts, and that generated in the mouth would be too slight to produce appreciable results.

Dr. I. C. Edington, Rochester: There is one phase of the subject that has not been considered. I had a patient who complained of neuralgia and metallic taste in her mouth from the effect of amalgam fillings. I replaced these with gold fillings and gold crowns. Some months later she returned, complaining again of the metallic taste, and suggesting that pure gold had not been used. I consulted Dr. Palmer and he said galvanic action was possible between different qualities of gold. She had two or three 22K. gold crowns, soldered with somewhat lower carat, and the fillings were of course pure gold. I concluded nothing could be done, and the metallic taste continued, though it was not as bad as it was when the amalgam was present.

AN OVERCROWDED PROFESSION would not be the burden of professional complaint if the people were taught to employ medical counsel earlier, oftener, and to retain it longer, as they should, before people have to be sent to bed by illness. Twice as many physicians are needed by the people as are employed. In times when epidemics are pending or approaching the people should be put in organic and functional condition for meeting and successfully combating disease. It is now the custom to wait till the human machine is broken and prostrate before asking medical counsel and aid.—*Alienist and Neurologist*.—How about this for dentistry? *Ed.*

CONGENITAL CYSTS OF TONGUE—John Ward Cousins states that congenital cysts of the tongue are not a common class of tumors. They generally occur in the middle line between the genio-hyo-glossus muscles, or between the genio-hyo-glossus and the mylo-hyoid. Sometimes they remain unchanged for many years. Their contents consist of soft sebaceous matter, and occasionally they contain also hair and solid masses of true dental tissue. The cyst wall is lined with squamous epithelium, and is of delicate structure and easily torn, but it is occasionally thick and fibrous. These tumors do not fluctuate, but feel elastic and tense on palpation. They are generally observed in young adults, and their existence is often overlooked during infancy and early life. They are painless and increase with the development of the individual. Irritation is apt to develop inflammatory changes in them. Congenital cysts have their origin in the accidental displacement of some epithelial structure.—*Brit. Med. Jour.*

Digests.

HYGIENE OF BRIDGEWORK AS EXEMPLIFIED BY A PIECE OF REMOVABLE PORCELAIN BRIDGE. By Joseph Head, M.D., D.D.S., Philadelphia. Read before the New York State Dental Society, May 15, 1902. The frequency of gum infection, and the ease with which this infection results in pyorrhea alveolaris, have long taught the thoughtful dentist that all dental substitutes must be constructed primarily so that they can be kept scrupulously clean. Much has been written of men who lived to a good old age and who never saw a tooth-brush or heard of a mouth-wash. Such people have existed and do exist; also, strong and healthy people have lived for years covered with vermin, and still live. These latter no doubt think the conventional man overfastidious, but in spite of such sneers cultured men will never again willingly harbor fleas, and the time is surely coming when it will be considered equally revolting for a mouth to swarm with the microorganisms of putrescence and disease.

Dentists are those by whom this reformation is to be secured, and therefore they should be the last to increase the contamination in the mouths of their patients through filth-collecting appliances. Many a dentist, when cleansing a set of teeth covered with putrescent tartar, has wished that he could take those teeth from the mouth, scrape them, boil them in some antiseptic, polish them on the lathe and put them back into their original sockets. He knows in his heart of hearts that that is the only method by which he can be absolutely sure of making such teeth perfectly clean and the gums free from infection. But as this is not feasible, through three or four sittings, with the necessity for his greatest care and skill, he scrapes and sterilizes, almost as well as he could do in a few moments if the teeth were out of the mouth.

The perfect cleansing of infected gums and teeth is now recognized as one of the most difficult operations that the dentist has to perform. Perfect cleansing of the teeth is a task that the average patient cannot do for himself without professional assistance. Yet in spite of all this difficulty in cleansing the natural teeth, each year hundreds of dental appliances are inserted, so constructed that even dental assistance cannot keep them wholesome and clean. Unless a dental appliance can be kept at least as clean as the teeth could be

without it, it has no excuse for existence. Mouths at best are none too clean. He who places a filth-collecting appliance, no matter how beautiful it may appear, has injured when he claims to have benefitted. These truths are so self-evident as to be elementary, and I would ask pardon for accentuating them, did I not hope to use them as axioms to illustrate why, all other things being equal, removable is to be preferred to stationary bridgework.

If, as is evident, the natural teeth could be more perfectly cleansed out of the mouth, it needs no argument to prove that the removable bridgework of itself is preferable to stationary bridgework, for the former can be made cleaner than the teeth, while the latter at best can be made only as clean. All stationary or saddle bridgework

FIG. 1.



FIG. 2.



should be so constructed that each day floss silk can be passed between every part of the structure and the gum on which it rests. And this, as I shall presently demonstrate, is quite possible even where the closest apposition is obtained between the structure and the gum, providing the appliance be made to touch the tissues on a curve approximating a straight line, as in Fig. 1. If, as in Fig. 2, the gum contact has a sharp curve, the passage of a thread will be difficult or impossible. The saddle bridge is in many instances so much more satisfactory than the removable bridge that it will always have its advocates if it is constructed so that the bacteria and products of fermentation can be removed each day from the gum line. Under these conditions its use is perfectly defensible, but if such hygienic provision be not made such an appliance is contrary to the modern science of bacteriology and hygiene. The advocates of the ordinary saddle bridge claim that if it be made to press firmly upon the gum, such close apposition is obtained that food collections do not occur. They say that on removing such an appliance after years of use a slight reddening or superficial stasis of the gum tissue alone will be found.

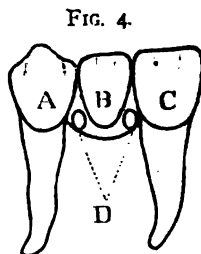
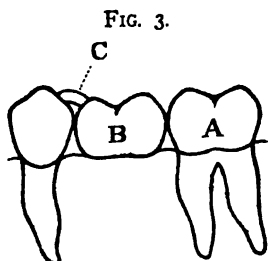
But even this superficial stasis is a serious menace. What causes it, this reddening, this exfoliation of epithelial cells? It does not oc-

cur under removable bridgework, where daily cleansing and sterilization are performed. Clean, well-fitting metal or porcelain would never cause it. The superficial stasis can arise only from bacterial infection, and such infection is a menace to the peridental membrane of the teeth to which the structure is attached. No joint of gum and metal, however close, can hope to exclude the bacteria, and while mucin is secreted by the gum such bacteria will never lack nourishment, even though the ordinary food in mastication may possibly not enter. Even, for the sake of argument, if such a tight joint were obtained between the structure and the gum as to exclude bacteria, this tight joint could not exist where the bridge joined the neck of the tooth. For here we have the free margin of the gum which cannot be cleansed, and also there is the movement of the tooth in the socket which must allow liquid proteids to enter, thus furnishing food for the germs of fermentation and putrefaction. These, in their turn, are most likely to cause peridental infection—the greatest possible danger that can threaten the welfare of the teeth.

Hence we must conclude that the use of the saddle bridge so constructed as to be incapable of being cleansed is unwarranted. It is true that some affirm these same bridges have been used with satisfaction for years, and plead that this should count for something in their favor, but it must be remembered that what may be tolerated in one mouth may not be in another. Some mouths breed dangerous infections while others do not, and we can usually be sure that a filth-collecting bridge will be safely tolerated by the tissues only after we have seen it proved. We have no right to subject our patient's mouth to the risk of infection because a certain limited percentage of mouths can withstand infection without serious consequences. Whenever a stationary bridge is placed the mouth should first be carefully examined to see how much care the patient should take to keep the teeth generally clean. Mouths, as before stated, vary in this respect. Some will collect large quantities of infectious tartar in a week, while others will remain comparatively clean, with half the care, for months at a time. Thus the individuality of the patient should be studied; mouth washes should be prescribed, and he should be told just how often his teeth need to be polished, and how often the brush, floss silk and mouth-wash should be used. Patients as a rule are grateful for such instruction, and will readily appreciate its importance. When by thorough treatment the mouth has been freed from

infections, two kinds of stationary bridges may be employed. First: The bridge fastened only on one side and supported by a pin resting on the sulcus of the tooth on the other side, thus allowing free movement of the tooth and bridge, and also allowing the passage of floss silk under the pin down between the bridge and the gum tissues. Second: A bridge fastened on both sides, which has the advantage of greater stability, but possesses the great disadvantage of preventing the natural movement of the teeth.

The bridge fastened on one side and supported on the other may be constructed as follows (see Fig. 3): A represents a crown, B represents the dummy or bridge, C represents a pin from the bridge resting on the sulcus of the bicuspid, under which, as before stated,



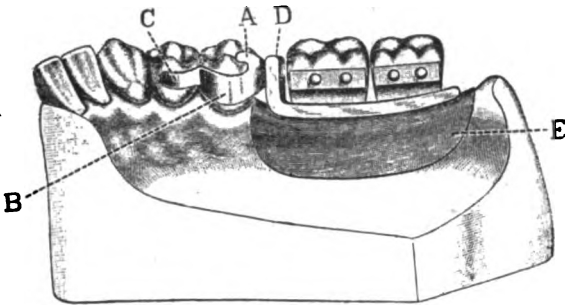
a piece of floss silk can be slipped and passed along the gum even to the crown, A. Where a single space is to be spanned, and the abutments are firm, this is a most valuable bridge, as it has ample stability and can be cleansed as thoroughly and easily as an ordinary crown.

If, however, greater stability is needed, and the bridge has to be fastened at either side, as is frequently necessary with the anterior teeth, the following device can be used for cleansing the underlying gum: Fig. 4 represents a lateral incisor bridge; A is the cuspid crown, C the central incisor crown, B the lateral incisor dummy resting snugly on the gum; D represents two small grooves going under the bridge between the necks of the crowns and the lateral incisor dummy. Through these holes floss silk can be passed, and the bridge and necks of the teeth be easily cleaned each day. These holes, while invisible to the observer, allow free passage of the mouth-wash, which, when properly used, can keep the necks of the teeth as free from bacterial deposits as though the bridge were not present.

The movable porcelain bridges that are responsible for this long

preamble on bridgework will now be considered. The first, intended to replace lost molars where support from the teeth is possible on one side only, is constructed as follows (see Fig. 5): As observed, the teeth back of the second bicuspid are missing. A gold clasp, B, No. 22 gauge, is fitted to the second bicuspid; to the ends of the clasp gold spurs, C, which half embrace the first bicuspid near the gum line, are fitted and soldered. Then a piece of pure gold, gauge No. 36, is soldered to the clasp at the posterior aspect of the second bicuspid and burnished into the occlusal groove. When this is stiffened with gold and solder it will form a spud that will prevent

FIG. 5.



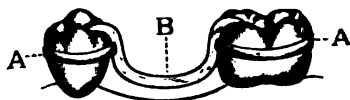
the clasp from being driven into the gum by the force of mastication. The clasp and spud should now be polished to the lines desired, and a thin coating of borax flowed over them so as to expedite future soldering. They should be then placed upon the model and a right-angle piece of No. 14 platinum-iridium wire should be adjusted to it and to the gum line, as in Fig. 5, D. Then platinum foil one one-thousandth of an inch, E, should be burnished on the ridge to fit the model. The angle wire should be placed in position on it; continuous gum body should be placed on the angle wire and platinum foil, and rubber teeth of the proper size and shade should be placed upon the body just as if it were the preparation of a rubber case. When the body has been carved to the proper lines of the gum the platinum foil, the angle bar, the teeth and body should all be removed together, placed in the oven, and given a thorough glaze. When the porcelain is cool the platinum foil should be stripped off, new foil should be burnished to the model, new continuous gum placed on the foil and the porcelain pressed down hard upon it to a point where the articulation is a little high. This excess of articulation is necessary in order

that perfect occlusion may be obtained when the case is finally fitted in the mouth, and the second portion of body is necessary to make up for the contraction caused by the fusing of the porcelain piece in the first bake. When the porcelain has been carved a second time to a satisfactory line it is removed again on the platinum foil and placed in the oven and baked once more. After baking and after the platinum foil is removed the porcelain block should accurately fit the model. If gum enamel be necessary there will have to be a third baking, but for this no platinum foil will be needed to preserve the contour, as the continuous gum body fuses at a higher point than the enamel. Fig. 6 shows the finished piece. When the porcelain block is finished we have a gold double clasp with spud, and a porcelain

FIG. 6.



FIG. 7.



block with a platinum bar running through it. It now remains to join them together. The clasp is placed in position on the model; the end of the porcelain block that goes next to the clasp should be ground until the platinum is clean and fresh enough to receive the solder. Then to the end of the ground porcelain a thin backing of pure gold should be burnished to make a tight joint with the porcelain, and the middle of this backing should be torn so as to expose the platinum and make a union of solder with the clasp and gold backing and platinum bar easy. The clasp and block should then be placed in position and soldered in the usual way. It might be well to state that coating the gum enamel with shellac varnish prevents any of the investment from sticking to it during the process of soldering.

The other bridge I wish to speak of is for a space where a single molar or bicuspid is missing, with a tooth on either side sufficiently strong for an abutment. It is made of porcelain attached to platinum clasps as follows (see Fig. 7): A represents iridio-platinum clasps of No. 14 gauge wire made to encircle the molar and bicuspid. A U-shaped piece, B, of the same wire is soldered to the clasps so as to rest on the grinding surfaces of the molar and bicuspids and also conform somewhat to the gum line. As in the other case, platinum

foil is burnished to fit the model in between the teeth. The clasps and connecting platinum U are placed in position, continuous gum body is placed on the platinum and wire, and a rubber tooth is adjusted as in the other case. Two bakings with platinum foil are required and one for the gum enamel, which finish the appliance, as no further soldering is required. It might be well to state that

FIG. 8.



platinum solder is of necessity used in the construction of the framework that holds the clasps in position. Fig. 8 shows the finished piece.

These devices are not theoretical, they are practical—are in fact being worn by many patients at this moment. They have the great advantage of cleanliness and stability; and their use does not necessitate the laceration or removing of the enamel from the teeth that serve as abutments. These spuds prevent motion under mastication and so avoid wear and cutting of the supporting teeth, and if the patient is properly instructed, such appliances can ordinarily be worn for years with comfort and safety.—*Cosmos*.

FUNCTION: ITS INFLUENCE ON STRUCTURE. By C. N. Peirce, D.D.S., Philadelphia. Read before the Boston and Tufts Dental Alumni Association, April 9, 1902. That tissues are made of cells of original or altered shape, separate or confluent, is well known. That the arrangement of tissues into organs is due to the multiplication and direction of cells is also evident. In the higher organisms we have muscle converting the results of nutrition into muscle; skin making more skin; brain making more brain; bone making more bone, etc., etc. In all this reproduction of structures we should appreciate the fact that the more perfect is but a modification or transformation of the less perfect. But in this whole plan of creation we must accept all changes as an endless succession of cause and sequence, influencing all matter animate or inanimate. While the foregoing has but an indirect influence upon the theory of use and disuse modifying structures, yet it does point to the condition

which the following paper will attempt to emphasize, namely, that organs and organisms are but a modification of something that has preceded them.

Influence of Use and Disuse Upon Tissues.—So difficult is it to reach the exact truth regarding any proposition on the more or less permanent and transmitted alterations in the structure of organs and animal forms, that one feels much disposed to hold his judgment as suggested by your late townsman, John Fisk, "in readiness for revision." The effect of use and disuse on structures is, however, so manifestly persistent that conclusions are drawn without much hesitation, and it is only when the query as to limitations is made that the possible recognition of other forces may step in and say—thus far shalt thou go. Most of those who have been considering the factors in evolution since the days of Lamarck (1744-1829) place great importance upon the effects of disuse in the atrophy of organs, and give many illustrations of its influence, such as the weakening of the muscles of the ears in domesticated animals and in man; the abortive eyes of moles, certain rodents and cave fishes; also the lighter wing bones of domesticated ducks and other fowl; the reduced size of the little toe in man; the reduction of the toes in the horse; and we might add the appendix vermiformis in man. Illustrations may be cited almost without limit, resulting from disuse or absence of function. On the other hand, instances quite as numerous may be given showing that function or use has a marked influence in not only facilitating development, but oftentimes in increasing the size of the organ and the efficiency of the animal possessing it. A few of these that are familiar to you all may be cited, such as the leg-bones of the varieties of the fowl; the udders of the cow and the goat; the powerful limbs of the heavy draught horse, as well as the delicate structure of the racer; the efficiency of the toes of man born without arms, and also the toes of the men and women of Panama, who fish for oysters in the ocean when the tide is running in and the water in which they are standing is to their armpits; the dermal surface of the hydra adapted to its environment without reference to which side is out; the beak of the shoveler duck; the baleen plates in the mouth of the balenoid or great whale; the muscle of the blacksmith's arm in response to its forging; the increasing size of the great toe from carrying the weight of the body; the thickness of the epidermal tissues in the palms of the hands and

the soles of the feet; the growth of corns; these latter may come from friction, pressure or strain, but they are nevertheless subject to influences which may properly be termed use.

That the flow of blood is increased towards organs or structures performing work is a very natural assumption, and that parts not used or exercised would proportionately be deprived of that nutritive fluid is certainly a sane conclusion. Frequently recurring efforts then would simultaneously supply the tissue with more blood and hence better nourishment, so that as an inevitable result the size must be increased, and by transmission succeeding generations be naturally influenced, while with the reverse, the absence of nourishment must result in vessels of diminished size and less pronounced tissue.

It is then quite true that evidences of not only progressive development, but of reversion, retrogression, atavism, if you please, can be cited almost without limit.

Mutilations Not Transmitted.—Before attempting to utilize these statements as anticipated, a word must be added about mutilations. With this theory of the influence of use and disuse upon structures, efforts have been made to associate the idea that mutilations should also be so intimately connected as to modify any statement made regarding the transmission of an atrophied or an enlarged structure. The facts, however, disprove the transmission of mutilated organs. Frequently the experiment has been made, but always with the same result. Structural alterations resulting from mutilations are not transmitted.

Influences of Environment.—In all animal structures we have two alternative propositions expressive of their uses. *Either the necessity for and attempt to use preceded the adaptive structure, or the structure preceded and gave origin to the desire for use.* The facts at our command certainly make the first proposition much the more probable of the two. The structures of living beings are either adaptive or non-adaptive; they are either in anticipation, fitted to meet the peculiarities of their environment, or they are not. It is an almost everyday experience that changes in environment occur without warning or preparation for them on the part of living things. If changes are very great the animal may succumb, but usually the elasticity of life is such that the influence of the environment is tolerated, and the special adaptations must follow, and not precede, conditions of climate, location, population, food, etc., etc. In connec-

tion with this we have the other important consideration, nutritive material must be called to affected localities to sustain the change, whether the tissue involved be muscular or otherwise. One of the direct evidences which we have in support of the view that motion affects structure directly is that organs are increased in size and power by use. This increase is of course limited by the fixity of all the organs, so that one cannot be increased to the detriment of the others in use. Illustrations of this are not necessary, beyond stating that the limitations of each organ must be subservient to the possibilities of congenital structure. Especially is it desirable now to direct your attention to the query, "Are the hard and most dense structures, such as the tissues of the teeth, subjected to the same influences as the more vascular, and if so, do they respond as certainly to use and disuse, or impressions of friction, pressure and strain?" This is assuredly an inquiry in which dentists are certainly largely interested, and in the answer the whole scope of what we term operative dentistry is involved.

A simple and not infrequent condition, with which you are all familiar, is the firm union which takes place between the cement of the root of the tooth and the process forming the socket, probably most frequently located in the mouth of the seamstress, who has been accustomed to biting off threads with the convenient but much abused cuspid. Molars and bicuspid are, however, liable to the same anchlyosed condition between process and cement where the teeth on the opposite side of the mouth have been prematurely lost, or where the individual has been in the habit of using one side of the mouth exclusively in the mastication of food. The superior third molars, when crowded, are also from the strain, which is continuous, similarly attached to the process.

Reference to some of the simplest vertebrate teeth illustrate this influence perfectly. In the little dogfish but recently hatched you will find the external surface carried over the jaw utilizing the spines (placoid scales) but slightly modified, while under the influence of subsequent function they increase in size and density. Arising from the integument may be added also the almost endless variety of teeth found in the class *Pisces*, or fish tribe, these offering in every particular a most remarkable differentiation as regards size, structure, attachment and density. The teeth of the shark are but modified spines, their size and structure corresponding with location and func-

The latter being the adaptive agent. Animals such as the opossum, using their almost numberless teeth only as prehensile organs, simple cones on the maxillary, with size and shape so nearly uniform, may well be termed homodonts. Though simple cones, they are not less adapted by their use or function.

By this time you have doubtless anticipated the trend of my thought. Most certainly what has been said would place all teeth, simple or complex, in the same line of development, and this is true without reference to their origin being from the epiblastic or hypoblastic membrane or layer. In this then the teeth of the following classes must be included: Marsupial, Cetacea, Insectivora, Rodentia, Cheiroptera, Carnivora, Proboscidea, Articulata, Perisodactyla, Lemurs and Primates. Use or functional influence, exerted, must specialize, and render them most efficient in serving the needs of the animal, as preassimilative organs, and that without reference to the animal being terrestrial, arboreal or aquatic.

This much has been said, you will think, rather dogmatically; to modify the statement a few additional illustrations may be pertinent. The nine-banded armadillo examined from the side of the crania beautifully displays the absence of enamel on the teeth; that this condition has been reached by a process of retrogression or degradation seems to be fully established. Charles S. Tomes has demonstrated that the tooth germs of this armadillo have distinct enamel organs, which are subsequently aborted as the tooth comes to maturity. This discovery Mr. Jacob L. Wortman, in his article on comparative anatomy of the teeth in the "American System of Dentistry," says "is important, since it indicates pretty clearly that the loss of enamel is a mark of degeneracy, and leads indirectly to the conclusion that the armadillos at least are descended from ancestors with enamel covered teeth, who in all probability were the possessors of a completely developed permanent set." The only assignable cause for this degenerate condition—the absence of enamel—is the jaw movement and food habit, this group of animals having a long tongue covered with a viscid secretion for the capture of insects which constitute their food, the same being swallowed with little or no mastication.

Another conspicuous illustration is found in those animals having the antero-posterior movements of the lower jaw. The molars of the muskrat, of the capybara and of the India elephant, representatives of

widely different animals, are so similar in the transverse arrangement of the enamel infoldings, and in their efficiency in the trituration of food, as the jaw is moved front and back, that we cannot overlook their pertinency at this time.

The extinct horse, the modern horse and the rhinoceros each has quite the same mandibular movements and jaw excursions, hence the same triturating ability must correspond with the enamel infoldings, which are not, as in the previous case, arranged in a transverse manner, but at various angles, so as to render the most efficient service. The molars of the carnivora, as well as the incisors of the rodentia, are not less conspicuous illustrations of the specialization of structures than those which we have enumerated.

You may very appropriately make the inquiry as to the ancestral influence in the illustrations given. It is doubtless an important factor, but it nevertheless does not detract from the influence of the original habit, which has established the dental structures which have been so persistently transmitted.

Cusp Addition and Cusp Concrecence.—Again the inquiry may arise: Are these isolated cases? to which the response shall be, that all animals with a specialized food habit display the same peculiar correspondence between jaw movement and adaptation of tooth structure which renders the most efficient service in the trituration of food. Assuming the foregoing to be a correct exposition of dental evolution, adaptation and function, the origin and development of the human molar follows, its evolution being emphasized through "cusp addition" rather than the theory of "cusp concrecence," though the latter has been so strongly urged by some German odontologists (Professor Schnable, Dr. Carl Rösa, Professor Kükenthal).

These two terms are thus placed that some short explanation may make clear their significance. The former, cusp addition, is formed by the addition or rather by the projections of immature cusps to the sides of a primitive single cone tooth, such as is found in the dolphin or toothed whales, while the concrecence theory necessitates a combination of these simple conical forms being cemented together, the tip of the cone constituting the foundation for the future cusp. In order that this theory should be sustained, all mammals possessing compound or complex teeth must at some early period have had a very much larger number of teeth, but all of quite a simple conical form, and these must have been grouped together in order that the

tritubercular, the quadritubercular or the multitubercular crown might be formed. In order to complete the adaptation, essential to normal occlusion, the exercise of their function would certainly have to be brought into requisition, and even then much friction and strain would be required in order to reduce the triturating surface to a satisfactory working condition. A very serious obstacle to this theory, however, is the source of the essential force that is to bring the cusps or points of these individual teeth into variable groups according to the more or less complex patterns of the prospective crowns. Enough now of this concrescent theory has been said to make you familiar with the processes involved.

In reference to the cusp addition theory, certainly every observing practicing dentist has noted projections from the crowns of permanent teeth resembling immature cusps, and these are not always confined to the crowns of molars; incisors and cuspids have shared in these projections sufficiently often to indicate the part they have probably taken in tooth evolution.

One more illustration in favor of this cusp addition theory. Every one who is at all familiar with the lower molars and their fifth cusp will give evidence of its location between the lingual and buccal distal cusps. Never does it make its appearance on the anterior or mesial part of the crown, but always on the distal, and the third molar, which in so many mouths is in a degenerate condition, is very rarely in civilized life more than a quadritubercular crown.

Those of you who have given little thought to this method of tooth development will doubtless think that it requires some exercise of the imagination to see new additions to what was originally a single, simple, and more or less conical tooth. But you must appreciate the fact that Nature does not work rapidly in the modification of structures, and the language of Lamarck indicating this is certainly wise and pertinent. He says: "The production of a new organ in an animal body results from the supervention of a new want continuing to make itself felt, and a new movement to which this want gives birth and encouragement, * * * and that the development of organs and their force of action are constantly in ratio to the employment of these organs."

Imagine these minute projections and ridges actually present, and in the succession of generations see them increasing in size and adapting themselves to the service of the animal through the influence

of the friction or impact of the food habit, and you will see a condition that was most certainly an early effort at tooth formation and at a time when much that is now was immature.

A word regarding embryology, as a factor in elucidating this subject. You are all familiar with the enamel organ and how it is formed, also with the origin of the dental papilla; both of these germs, if the eye does not deceive one, are but a single diversion or projection from the parent membrane. That calcification beginning at several points cannot be regarded as any evidence that either is a compound structure. So the evidence we get from embryology but sustains the proposition that the simple, single, cone-shaped tooth is the parent of the multitubercular crown.

From the previous pages you infer that the teeth in their development, like the more vascular tissues, are dependent upon function and inheritance for their morphology, structural arrangement, density and size. In the exercise of those factors should be placed as of first importance, jaw movement, or the mechanical force involved in these mandibular excursions. This force must of necessity vary with the food and the difference in the degree of resistance it offers in its comminution. Following this would come that most important evolutionary factor, heredity. The formative influence of function is seen in the teeth of the Gasteropoda, where variety in shape is a constant concomitant of variety in food. It is in evidence in the Mysticete or Balaenoidea, where the great plates are so well adapted to securing low forms of life in the sea. The sharp, cone-shaped teeth of the Denticete, so well adapted to seizing live prey upon which the sperm-whale lives, illustrate it. Also in the molars of the Herbivora, where the infolding of the enamel, with less dense structures, always presents sharp surfaces for the cutting of dry and coarse vegetation. And in the molars of the Proboscidea and Rodentia, where the transverse enamel layers are so efficient in the trituration of food. The trenchant-shaped molars of the carnivora illustrate it in their lacerating capacity, the edentata also in the abortive enamel from the tooth crowns. It is seen in the teeth of children where the trituration or comminution function is delegated to the stomach, and in the third molar of man, where it is variable, in time of eruption, in size, structure, shape and durability, from the absence of function, in the modification of diet, and the shortening

of the lower jaw with growth of civilization and increased intensity of the nervous system.

Conclusions.—In conclusion, let me repeat here the following postulates, some of which I have previously used and published—*First:* That the tendency is to the suppression of organs and tissues not used, and the development of those most used. *Second:* That the teeth, notwithstanding their density, are, like the more vascular tissues, subject to modification from use and disuse. *Third:* That the food habit and cumulative results of heredity have been important factors in shaping tooth forms. *Fourth:* That the degree in which teeth are modified from a simple type is in correspondence with the differences in the degree of resistance to be overcome in the mastication of food. *Fifth:* That the restriction and limitation of diet has contributed to the specialization of the teeth. *Sixth:* That the varied and omnivorous diet of the human family and the disuse of their teeth have retarded the specialization of these organs and encouraged dental decay. *Seventh:* That an invariable result of the effort of specialization is a reduction in the number of teeth. *Eighth:* That in the trituration of food there is a constant effort to establish such excursions or mandibular movements as will be most efficient in this preassimilative process. *Ninth:* That the mandibular movements in the effort of mastication must largely control the specialized condition of the teeth, the glenoid plates and the condyles.—*Items.*

BLEACHING TEETH. By N. S. Hoff, D.D.S., Ann Arbor, Mich. Read before the Tri-State Meeting at Indianapolis. The subject of decolorizing teeth stained by what may be termed the natural or consequent causes of accident or carious destruction of the teeth is well discussed in our text-books and by casual writers on the subject, but the removal of stains produced by chemical agents used in the antiseptic treatment of necrotic pulps and alveolar abscesses is not clearly set forth in any text-book, nor has it been well brought out in the discussions of this subject in dental societies or literature. Probably the reason for this is that little attention has been given to differentiating specific methods designed to decolor this class of stains; or dentists are becoming more careful in the use of such antiseptics as are liable to produce this class of discolorations. It is, however, true that the most efficient antiseptics are those substances which tend to produce color change in tooth struc-

tures when used in certain classes of teeth, or when their use is long continued.

For our present purpose it may only be necessary to state that teeth with thin, transparent enamel show this kind of pigmentation by contrast more pronouncedly than those do which have more substance and less pronounced refractive qualities. Structurally some teeth respond more readily to this class of color-making reagents than others. The age of the tooth and its physical integrity are sufficiently important factors to be seriously considered when making applications of coloring medicines in the treatment of teeth which are exposed to view. This is, however, a subject of itself—important, but too long to discuss in this paper, although it has much to do with the matter here presented for consideration.

One need not confine his observations to his own practice to realize that many otherwise beautiful dentures have been seriously marred because a prominent tooth has changed color, and it seems that no adequate effort is being made either to prevent or correct this condition. A prominent dentist, to whom we remarked that we were much interested in bleaching such teeth, said that he had not had occasion to bleach a tooth for years. It may be that some of us are becoming accustomed to variegated teeth, and are losing our sense of the truly esthetic. However this may be, we have encountered these distasteful conditions with such frequency, and have experienced such difficulties in overcoming them, that we have felt this was a very proper subject for consideration.

The remedies generally employed in antiseptic treatment, and which leave such undesirable results, are the essential oils, eucalyptus, cloves, cassia, wintergreen and others; carbolic acid, creasote, iodine compounds, hydronaphthol, tannic acid and other similar drugs used in canal treatment.

In considering the methods employed to decolor teeth stained by such drugs it will be difficult to dissociate them from other accidental agencies which are liable to be associated, and which may materially modify the treatment used. To secure effective results in the shortest time it is important that we first determine the cause of the stain and its character. This will influence the selection of the bleaching agent or process, but when a tooth is deeply stained and the condition is of long standing the problem becomes complex

indeed. If the stain is of recent occurrence and the cause be known, a proper chemical reagent may promptly effect the desired decoloration. In old stains the drug which caused the discoloration may long since have suffered decomposition, though its effects are still present, and perhaps in an unintelligible form demanding the most penetrating and destructive pigment solvents practicable.

In ordinary bleaching of teeth chemical reagents are employed on two principles. One is the removal of the pigmented structure by oxidation, the other decomposing it chemically and structurally by the process of reduction. It is questionable whether both methods may not be essentially oxidation processes; they certainly act so in bleaching organic stains. In both processes mechanical and physical detergent aids are also essential to complete results. Of bleaching agents, direct oxidizers are such as contain oxygen in loose combination which can be set free without injury to the tooth, and at pleasure. The peroxids are illustrations of this class. The reduction reagents are such as have the property of breaking up pigment compounds by chemical combinations or interchange of elements having stronger mutual affinities than those which prevail in the pigment compounds or the bleaching agent itself. The chlorin and sulfurous oxid methods are good illustrations, although in many cases these agents are supposed to act as indirect oxidizers.

The question which we propose you shall consider is, which of these processes and agents are of the most value, and of practical application in decoloring teeth stained by the class of drugs above mentioned? It may be of advantage to study this subject from its theoretical aspect, but should we attempt to do so we are likely to become disheartened, as the problem becomes so complicated that it is practically incapable of complete solution. The exact chemical nature of many of these substances used as antiseptics is not known, or if known is of such a complicated nature that it is difficult to determine what the reactions may be which take place when they are brought in contact with the tooth structure in its normal condition. It is still more difficult to determine the nature of possible reactions when there is present in the tooth structure the chemical detritus resulting from the necrotic processes. Notwithstanding these difficulties, successful methods of bleaching teeth will never be made practicable until some definite theoretical knowledge is

obtained. This may be secured by laboratory research, but if it be not an actual deduction from successful clinical experience, it must necessarily be so confirmed.

In order that we may secure some basis for starting an investigation of this subject, we submit a brief study which may be of some value. That a comparative study of the powers of the well-known bleaching agents might be made, we selected a number of teeth which had been extracted for some time and were thoroughly dried. These were then cleansed of all carious substances, the apices of the roots cut off, and the pulp canal and chamber reamed out so that no pulp remnants were left. They were also thoroughly cleansed externally by mechanical means, and then with hot solutions of chlorinated soda. This left them practically clean and free from all organic contamination. They were then soaked for three days in the following solutions: Full strength solution of eucalyptol, old and dark oil of cloves, old oil of cassia, Black's "1, 2, 3" mixture and aristol, iodized phenol, carbolic acid ninety-five per cent solution; old creasote, solution of iodoform and ether, alcohol solution of betanaphthol, and a glycerin solution of tannic acid. After removing them from the stains they were dried in the sun and by a gentle heat until all moisture had been driven off. The result was a considerable discoloration in each case, varying from old gold in one to almost a purple in another.

One of each stain was then selected and cut into eight transverse sections, beginning at the apex of the root until the crown was reached. A proof set made up of one section of each of the ten stains was reserved for comparison, and the remainder were subjected to the decolorizing powers of the following bleaching agents: twenty-five per cent peroxid of hydrogen, three per cent peroxid, sodium peroxid, benzozone, aluminum chlorid, chlorinated lime, and Kirk's sodium sulphite and boric acid mixture. These reagents are well known, with the exception of benzozone, which is a new organic compound of the peroxid class. It is benzoyl-acetyl peroxid ($\text{C}_6\text{H}_5\text{COO}\cdot\text{COCH}_3$), and is intended for disinfectant and antiseptic purposes. We selected it because of its being an organic peroxid. From a limited experience with it we are satisfied that it possesses valuable properties as a bleaching agent, especially of organic stains. We have classed these agents into two divisions, namely, the oxidizers and the reducers. The oxidizers will include

the four peroxids—twenty-five per cent pyrozone, three per cent hydrogen peroxid, sodium peroxid and the benzozone.

Dr. Kirk, in the "American Text-Book of Operative Dentistry," states that aluminum chlorid, as used in the Harlan process, has no bleaching properties, and that peroxid of hydrogen used in the process is the only effective agent, the aluminum chlorid serving only to set free the oxygen expeditiously. While this statement as to the reaction which occurs is undoubtedly true in the main, there is a strongly increased acid condition developed in the use of this process, which would indicate a chemical as well as a physical reaction, with the probable formation of hydrochloric acid. This acid would materially influence the bleaching process by its detergent action on both the mineral and organic stains and tissues. In our experience it seems to have had some advantage over the same strength solution of peroxid alone, and we are therefore inclined to classify it with the reduction agents.

The bleaching of the ten different stainings was under as nearly similar conditions as it was practicable to devise. Each set of sections was subjected to the several respective reagents for twenty-four hours at 60° F. Of course some of the reagents became temporarily heated while being mixed in the test-tubes. After twenty-four hours they were kept at 100° F. for one hour, and then removed from the bleaching solutions and repeatedly washed in several changes of distilled water.

They were carefully dried for several days in the sunlight and tabulated. As might have been expected, the twenty-five per cent pyrozone made the most creditable showing as a whole—bleaching all the stains satisfactorily except the iodine and creasote. These two stains were the most profound, and did not yield to the oxidizing influence of the pyrozone so well as they did to the alkaline sodium peroxid.

The sodium peroxid produced almost as satisfactory bleaching as the pyrozone; none of the specimens were as clear as some of the pyrozone, but all were very materially affected. The sulfuric acid used to liberate the oxygen in the process seems to have very materially affected the inorganic part of the sections. Such effects on the teeth in the mouth would necessarily contraindicate its use. It is unquestionably a great solvent of the organic structures.

The benzozone stood third as to effectiveness, so far as the clear-

ness of results is concerned. It produced nearly if not quite as satisfactory bleaching as the sodium peroxid, and although this agent gave a decided acid reaction while bleaching, the sections did not show any destructive acid effects. The acids in this substance are organic and weak, and consequently would not affect the inorganic tooth-tissues. This agent has the advantage over the pyrozone and sodium peroxid of not being readily soluble in water. It is soluble only to a fraction of one per cent. Consequently it does not act promptly, but continuously, so long as any undissolved benzozone is present. When a supersaturated solution is used, as was done in this case, or when the solution is made with heat, the bleaching continues afterward, though not so intensely as with the twenty-five per cent pyrozone, for a longer period than with any of the other bleachers. We found that there were traces of it in the fourth water used to wash out the bleaching agent. This quality would indicate that this particular agent has promise of being a very effective bleacher of organic stains, because it can be used with safety and the bleaching may be done more slowly than with the other peroxids, which are so easily decomposed when brought in contact with agents which manifest an unusual affinity for oxygen.

The three per cent peroxid showed comparatively slight bleaching properties, not sufficient to make it of any great value when used by this method. The aluminum chlorid did not make a very favorable showing; it was only slightly more effective than the three per cent peroxid. It produced its best work on the iodoform and the tannic acid stains. The chlorinated lime bleaching was about the same in degree as that of aluminum chlorid. It seemed to be slightly more effective in bleaching eucalyptol and iodoform stains. The sodium sulfite and boric acid mixture was the least effective of all the bleachers used. It does not seem to have any special affinity for the essential oils, creasote, or naphthol stains; the others were only moderately bleached.

It is probably true that the methods used in making these experiments do not justify the results, as they are not practicable without material modifications in practice; and it may be that some of the bleachers would be more effective if used under other conditions. Again, the staining was artificially done and may have been more profound than is likely to be met in actual practice. Nevertheless,

the conditions were similar in all respects, and the results will undoubtedly serve as a basis for judgment in selecting a bleacher for the several stains.

It certainly demonstrates one fact very significantly, which is that bleaching of this class of discolored teeth cannot be done as effectively by chemical reagents which act by decomposing the stain on the substitution theory, as it can by the oxidizing reagents or those which act at least through molecular oxygen, probably in the form of ozone, which effectively destroys the molecular integrity of the pigment or absorbs it. We have no doubt this conclusion will be supported also by clinical evidence. It certainly simplifies the question of selecting a proper method, as it in great measure eliminates all efforts to explain all bleaching processes on the theory of atomic disintegration. Should further research prove that the peroxids are especially adapted to bleaching this class of stains, it will simplify technical details. Should the pigment be most easily decomposed by an organic peroxid, benzozone may be used in such way as shall best utilize its peculiarities. Should it be a mixed or inorganic compound, the pyrozone bleacher should produce the most effective results. Should it be a pigment more soluble in the alkalies, sodium peroxid will be most satisfactory. The principle of most expeditiously utilizing the various peroxid preparations, and the devising of such methods as shall most effectively utilize all the virtues practicable of each drug or class, may be left to the ingenuity of the practitioner.

ALVEOLAR ABSCESS: ITS COMPLICATIONS AND TREATMENT. By James F. Wessels, D.D.S., Philadelphia. Read before the Pennsylvania Association of Dental Surgeons. Notwithstanding the greater success attending operations upon devitalized teeth since the necessity of aseptic precautions has been generally recognized, we are still called upon to treat cases of threatened or actual alveolar abscess. Owing to neglect or oversight on the part of the patient, extreme difficulty in utilizing known precautions in some cases, and untoward systemic conditions we are not as yet fully able to understand or control in others, it is not at all likely that alveolar abscess will in the near future cease to be a subject of interest to the dentist. It is therefore well to occasionally go over the ground, mark the progress made, and by a mutual interchange of

experience seek a better understanding of the phenomena and strive to secure better remedial results.

It is generally conceded that by far the larger number of cases of alveolar abscess are associated with a devitalized pulp; it does not usually, however, immediately follow the death of this organ. The tooth may continue comfortable for months, sometimes for years. Following the death of the pulp, after a longer or shorter interval, acute pericementitis, one of the most painful affections of the teeth, ushers in a train of symptoms, which if not checked culminates in alveolar abscess. It is well known that decomposition of the devitalized tissues leads to the formation of gases which produce pressure, irritation and congestion of the peridental membrane. The additional blood brought to the parts produces pressure upon the nerve filaments with which this sensitive membrane is so bountifully supplied, thus causing intense pain. If this congestion is not speedily relieved it will very soon terminate in suppuration and alveolar abscess.

Let us consider the symptoms of pericementitis. The tooth is somewhat more than normally sensitive to touch. There is a constant dull heavy pain; pressure, however, at first seems to give a sense of relief, but as the congestion increases and the peridental membrane thickens the tooth is raised from its position and becomes perceptibly longer, and is thus brought into occlusion before its fellows. Intense pain results, so that the patient is unable to masticate with comfort. The gum tissue over the root of the tooth is at first a little darker than usual and sensitive to pressure. This redness is later increased until the gum becomes nearly purple, and it is by this time apt to be considerably swollen and extremely sensitive. This condition usually lasts but a short time before pus begins to form, and we have an acute alveolar abscess to deal with.

When called upon to treat such a case we may at times be uncertain whether we are confronted with pulpitis or pericementitis, so it is of interest to compare the symptoms. We may remember that the peridental membrane is the organ of touch for the tooth, and that the pulp is more sensitive to thermal changes. In pulpitis the pain is often of a reflex nature and the patient is unable to locate the seat of trouble. In pericementitis the offending tooth is more readily located. In pulpitis changes of temperature, especially extreme cold, cause increased pain; while in pericementitis changes of temperature

seldom have any marked effect. Heat, however, at times, as in all inflammatory conditions, increases pain. Tapping the suspected tooth with a steel instrument is a method in general use for diagnosing a case of pericementitis; the diseased tooth, being more sensitive to touch than its fellows, usually responds. At times, however, the patient is unable to give us much help, one tooth seemingly is about as sensitive as another, and when several teeth in the immediate locality contain large fillings we are often in a quandary. I have noticed when tapping several teeth that the affected one usually gives a different sound. When this difference is evident I seldom hesitate to drill into the suspected tooth or to remove a filling.

After the offending tooth is located, attention should first be given to the pulp canal. The pulp will usually be found wholly or partially decomposed. The canal should be thoroughly cleansed, and if pus be not yet present an attempt should be made to avoid an abscess by counter-irritation, or by relieving the blood tension by lancing or leaching, and also, if necessary, by systemic treatment. A hot foot-bath just before retiring, followed by a generous dose of a saline cathartic, and another dose the next morning, will often assist to re-establish normal circulation in the diseased tissue. A dose of from six to eight grains of sulphate of quinin will often check the formation of pus. This may be followed by one-drop doses of tincture of aconite every hour until bedtime. Great care should always be used in giving aconite. I am in the habit of counting the hours between the time the patient calls and about nine o'clock p. m., and giving the patient just that many drops in a small phial with implicit directions to put the contents into as many teaspoonfuls of water as I have given drops, and to take a teaspoonful of the solution every hour as long as it lasts. If much pain is present, with high fever, a Dover's powder may be of benefit. An early resort to the above treatment will often arrest the untoward conditions and save the patient much pain.

Alveolar abscesses may be broadly divided into two classes, blind abscesses (those having no fistulous opening) and abscesses with a fistula. These may also each be subdivided into the acute and chronic forms. *Blind abscess* may be either acute or chronic. In the acute form it is simply an abscess, the pus of which has not as yet formed an outlet through the tissues to the surface. In the case of a chronic blind abscess we have a much more serious condition, and may

suspect necrosis of the alveolar process. The treatment in either case, however, is very similar. The pulp canal should be thoroughly cleansed and disinfected; after which it may be enlarged with Gates-Glidden drill, thus permitting the abscess to drain through the root of the tooth. If it does not do so, I do not hesitate to pass a broach through the apical foramen and endeavor to enter the abscess sac. The canal and sac should then be thoroughly cleansed or washed with a mild, non-irritating, but cleansing antiseptic; such as glycothymoline, etc. This may be followed by dioxogen, which will remove any pus that may still be present, as well as blood clots, etc.; it will also act as a hemostatic. I would, however, caution against using this latter agent early in the treatment, as owing to the pressure resulting from its rapid decomposition it is liable to give severe pain should much pus be present. After the abscess has been well drained dioxogen can be used with safety, and will prove of much service. As a rule I then inject a few drops of a ten per cent solution of zinc chlorid into the canal, forcing it through the foramen into the abscess; following this by a reliable antiseptic, such as Black's "1, 2, 3," Howard's mixture, campho-phenique, five per cent solution of formalin, etc., and then seal the cavity with gutta-percha. After allowing this to rest about a week I remove the dressing, and should there be no discharge at once fill the root. However, should pus be present, I treat the case the same as at the first sitting. Frequently a discharge will be noticed on the cotton dressing consisting of blood and serum, and sometimes a thin, light-colored pus. In such cases I cleanse the canal with dioxogen, again dry the root and place in a new dressing, the same as before, and dismiss the patient for a few days. Should the discharge be only serum or a little blood, I frequently cleanse the root canal with an antiseptic, and at once place in the root filling, but do not usually permanently fill the cavity for a week or two.

Should the abscess not heal after three or four treatments, more energetic measures should be adopted. It is in just such cases that amputation of the root end will be of value. When I find it necessary to resort to this, I anesthetize the gum over the root of the affected tooth, and with a lance make one cut horizontally and another vertically, meeting the first in the center; raise the little flaps formed and drill through the alveolar process to the end of the root, and thus produce an artificial fistula. When necessary a general anesthetic

may be used in this operation. Through the opening thus made the end of the root may be smoothed off or amputated. Before amputating it is best to thoroughly fill the pulp canal.

Abscess with Fistula.—When the case comes into our hands we not infrequently find that the pus has already made for itself an opening through the alveolus and the gum tissue. Usually this is through the gum on the buccal or labial side over the root of the affected tooth. Occasionally it is alongside the root, and makes its exit at the neck of the tooth, and may be mistaken at times for pyorrhea alveolaris; or again its exit may be at some point distant from the tooth. These abscesses may be of the acute or chronic form, and may require in some respects special treatment. The root canal should first be thoroughly opened and cleansed. Afterwards endeavor to force an antiseptic solution through the root and out through the fistula. I usually use for this purpose a hypodermic syringe, packing unvulcanized rubber in the tooth cavity, and through this passing the needle of the syringe to make a tight joint, so that sufficient pressure may be used to force the medicament through the root and abscess tract. After doing this successfully two or three times, I force dioxogen through. If the case is an acute one I inject a ten per cent solution of zinc chlorid, or equal parts of carbolic acid and tincture of iodine, through the tooth and fistula. I then dry the pulp canal and place in it a dressing; then, wrapping a little cotton on a smooth broach, I moisten it with oil of cloves and insert it into the fistula, allowing the end to protrude, and instruct the patient to remove it in about eight or ten hours. This keeps the abscess tract open at the surface and provides drainage, and prevents its healing first at the surface.

An abscess, especially if it is recent, usually heals after two treatments of this kind. If it does not I suspect the presence of necrosed bone, or that the end of the root is roughened, and instead of injecting zinc chlorid I use aromatic sulphuric acid, full strength, injecting this through the pulp canal and the fistulous tract. If this does not effect a cure, with a clean instrument, working through the fistula, I bur away any necrosed bone and smooth the end of the root. This, however, is not possible unless the fistula is nearly straight and near the seat of trouble. In unfavorable cases such means and instruments must be used as one's judgment suggests. There are cases where I find it impossible to inject a medicament through the root and fistula. In these, after rendering the root thoroughly aseptic, I fill at once and

continue any further treatment needed through the fistulous opening. I have found no advantage in keeping the pulp canal open for long continued treatment. During treatment I keep the fistula open by means of antiseptic gauze, or cotton moistened with oil of cloves. In some cases of chronic abscess on single-rooted teeth, if they do not heal after a reasonable time, I sometimes resort to extraction and replanting, and find it as a rule satisfactory, but do not recommend it except as a last resort. Abscesses of long standing are as a rule difficult to treat, and are not infrequently associated with necrosis. Such cases require time and patience. They need to be cleansed with a mild antiseptic two to four times a week until they show signs of healing, when once or twice a week will suffice. Overtreatment is to be avoided; give nature a chance and she will do wonders. I am persuaded that many cases of alveolar abscess are prevented from healing by too frequent treatment.

Fistulous Tracts.—It is surprising at times how pus will burrow through or between tissues. Usually it follows the line of least resistance, and gravity at times has an influence. Now and again it makes its exit far from the seat of trouble. Some time since I was consulted in a case where a young lady had long suffered from a dull heavy pain on the right side of the head and upper jaw. For two years she had been under treatment for chronic post-nasal catarrh, and her general health had been on the decline. I was led to suspect that a tooth with a devitalized pulp might have something to do with it, and on examination with an electric mouth-lamp found the right central a little off color; otherwise the tooth seemed normal. On tapping this tooth seemed no more sensitive than its fellows, but I noticed a slight difference in the sound. I cautiously drilled into it and found the pulp devitalized and decomposed. After cleansing the canal I injected into it a solution of phenol sodique, and was surprised to find that it made its exit through an opening just in front of the uvula. She told me that she had spent over two hundred dollars for treatment of catarrh, without relief. The case responded kindly to treatment, and in about two months the abscess seemed to have healed and the patient's health was very much improved.

In another case a mistake in diagnosis nearly cost the patient her life. The physician described a case he had just left, which he was treating for erysipelas with but little success. He stated that the face and neck were swollen, and the left eye nearly closed. The

patient, he said, had complained of her teeth, but he could not see anything wrong with them, except that the gums seemed swollen and congested. I suggested that the trouble might be an abscess. At his request I saw the case in consultation. I found the patient dull, with a high fever, the upper lip swollen so as to be even with the tip of the nose, and the left eye closed. The neck down to the shoulder was swollen, very much congested, and blue in color, resembling greatly a large bruise. I diagnosed an abscess at the root of the left central, and advised its removal. The tooth was very loose. Its removal was followed by the escape of about half an ounce of pus. The socket was cleansed with a solution of permanganate of potassium, ten grains to the ounce of water, and the patient directed to use the same as a mouth wash. I found on inquiry that the bowels had not been moved for five days. This in my judgment had much to do with the patient's serious condition, and I urged active measures to promptly relieve it, suggesting an injection of sweet or castor oil. The patient was only semi-conscious, with a temperature of 104, and the skin a yellowish white or putty color. This was at about ten o'clock a. m. The physician objected to the injection, saying that he thought the desired result could be accomplished by other means. I saw the patient again at four o'clock p. m.; she had less pain, otherwise the condition was unchanged; there had been no movement of the bowels. I again urged an injection, which was at once administered. At seven o'clock I visited the patient. The injection had produced the desired result, and the patient was resting quietly, with a temperature of 101½, a decided improvement. The next day the swelling was much reduced, the skin more normal in color, and the case progressing toward recovery. It was two months, however, before the patient regained her usual health. This supposed case of erysipelas was an alveolar abscess, and had not the error in diagnosis been promptly corrected and appropriate treatment energetically pursued, it would probably have proved fatal in forty-eight hours more.

Systemic conditions frequently favor the development of alveolar abscess. I have noticed this tendency in patients recovering from the grip, who have unfilled pulpless teeth. Systemic conditions often interfere with the treatment of abscesses. I recall one case treated for nearly three months without success. I noticed that the patient's health was much impaired, and suggested that she see her physician,

which she did. Within two weeks she developed typhoid fever. I did not see her again until after recovery, when I found the abscess entirely healed. Whenever I find systemic conditions interfering with my treatment of alveolar abscess, or any other lesions of the mouth that properly come within my care, I do not hesitate to administer appropriate treatment, in fact, feel it my duty to do so. I am aware that there is a difference of opinion on this point, and that some hold that in so doing a dentist oversteps his rights, and should in such cases always refer the patient to the physician. With this view I do not concur. The subject of *Materia Medica* and *Therapeutics* is included, and properly so, in the dental curriculum, and is given prominence in college and state board examinations. If dental practitioners have no right to use the knowledge so acquired and so tested when its use becomes necessary to the proper treatment of their patients, why these requirements? When the dental practitioner's competency in these branches has been tested and approved by those appointed to so do, or has been legally recognized, he acquires, in my judgment, a legal right to use this knowledge, indeed, it is his duty to do so whenever in his judgment the best interests of his patient are served by so doing. You will please understand I am referring strictly to those matters which properly come within a dentist's bailiwick; I have no reference to disorders he may detect which have no connection with legitimate dental work.—*Brief.*

ROOT FILLINGS AND THEIR RELATIVE VALUE. By Leo Greenbaum, M.D., D.D.S., Philadelphia. Read before the New York State Dental Society. Medical journals are replete with reports of cases concerning the uses of adrenalin hydrochlorid. Some of these are laudatory to a very high degree. From an extended use of the drug in the clinic of the Philadelphia Dental College I am unable to offer support to a spreading belief that this agent will supersede every known drug employed in the local arrest of hemorrhage. In such highly attenuated solutions as one in one thousand and one in five thousand it exercises appreciable contractile effects upon capillary vessels, making it a useful drug in many cases; but it does not give promise of promptly checking hemorrhage occurring around a tooth.

The acetate of eucain, although not so universally lauded as the preceding one, has received numerous indorsements as possessing

such non-irritating qualities as would enable it to outrank as a local anesthetic the eucain hydrochlorid. I procured this drug from the European manufacturer, and after faithful trial found that it possessed the same objectionable features as the former salt of eucain, *i. e.*, causing swelling of the parts into which it has been injected.

The subject of root-canal treatment is not new, but it is of vital interest to every practitioner. The severest application of modern antiseptics has been made in the treatment of pulpless teeth. Recognizing the difficulty attending the complete removal of organic tissues from root canals, and the decided liability to sudden septic changes involved in their retention, almost every known antiseptic has been introduced into pulpless teeth; and the following modes of treatment have been suggested in the hope of successfully eliminating a predisposition to septic changes after devitalization. The success attained in this direction is still far from being what we should like it to be; therefore any new suggestions should at once attract the attention of the profession and receive serious consideration.

Of all the materials which have been employed in root canal fillings at one time or another the profession seems finally to have decided in favor of gutta-percha and zinc oxychlorid. About ten years ago Dr. Callahan of Cincinnati introduced his sulphuric acid treatment, and upon careful reflection it becomes quite evident that it represents the only advance made in root-canal therapeutics in the twenty-five years ending with its presentation. Too much praise cannot be given Dr. Callahan for his method, and the ready and general acceptance accorded it bears sufficient testimony to its merit.

A few years after Dr. Callahan made known his treatment, Dr. Söderberg of Australia introduced a method of root-canal treatment comprising some new features. Recognizing the great difficulty in many cases attending the removal of pulp-filaments from attenuated and tortuous canals, Dr. Söderberg evolved the plan of removing as much devitalized tissue as he could, and placing in the canals a paste purposely compounded to so affect the remaining organic substances in the root canals that they should undergo mummification and hence present unsuitable soil for bacterial development. Dr. Söderberg's paste consists of desiccated alum, thymol, glycerol and zinc oxid. The remarkable drying power, together with the high antiseptic value

of formaldehyd, makes it a very valuable addition to Dr. Söderberg's paste. The formaldehyd has a hardening effect upon the paste itself, which is decidedly advantageous, as it insures retention in place.

More recently another method, fathered by Dr. Harlan, has been added to the list. This is known as pulp-digestion. It is the application of papain to the devitalized and gangrenous pulp.

The following experiments were made for the purpose of obtaining some idea of the relative value of these principal methods. In order to obtain a proper standard of comparison the most favorable conditions of aseptic root canals were produced by selecting normal teeth with accessible roots, two cuspids and three centrals. The pulps of these teeth were devitalized, every detail of the operation being conducted under the strictest antiseptic precautions. All instruments, the rubber dam and the hands of the operator were treated in accordance with the most modern knowledge of aseptic requirements. The clinic of the Philadelphia Dental College offered the necessary teeth for the experiments, and I had no hesitancy in justifying the act upon the basis of "means to an end."

After the pulps were devitalized the canals were filled with chloro-percha and gutta-percha points and the cavity filled with zinc phosphate. After six weeks the teeth were opened under antiseptic precautions, and the contents of the canals placed in culture media. The results were negative—no evidence of bacterial growth.

The second series of experiments was conducted with teeth in which canals were treated with sulphuric acid. These cases were selected—three containing recently devitalized pulps and three putrescent pulps. The treatment was that which is generally followed, 50 per cent sulphuric acid being used, afterward neutralized with sodium bicarbonate. This was continued until it seemed that the apex had been reached. The canals were then filled with chloro-percha and gutta-percha points. After three months these teeth were removed, the canals opened, and bacteriological examinations made. There were negative results, except in one of the putrescent cases, which showed evidences of pyogenic microorganisms.

The third series of experiments involved the use of mummifying paste. Six recently devitalized pulps were selected, and the result in two cases showed the formation of pyogenic microorganisms. In one of these two cases the root-canal contents upon removal were found to be very foul. The tooth was removed owing to trouble

and the desire for examination, and it was found that the mummifying influence had not penetrated beyond one-third the length of the root canal.

The fourth series of experiments was conducted with the method of digesting the root-canal contents. In place of papain, as suggested by Dr. Harlan, the analogous substance, "caroid solvent," was substituted. The reason for this change was the greater efficiency of caroid, and the ease with which it could be used, as there was no necessity for making a paste. In six cases, immediately after devitalization and partial removal of pulp, caroid solvent was sealed in the pulp-chamber, which after twenty-four hours was opened and washed out with a solution of sodium bicarbonate and filled as in previous experiments. In six other cases containing putrescent pulp tissue a few drops of caroid solvent were introduced by means of a pipet, sealed in the cavity with temporary stopping, and after two days washed out with alkaline solution; root canals filled as before. After three months the root-canal fillings of all these twelve cases were removed and presented for bacteriological examination. Results were negative in all but one case, which showed bacterial growths. All of these experiments were conducted under the supervision of Dr. O. E. Inglis. The personal equation may therefore be eliminated and the conclusion drawn that thorough removal of root-canal contents under absolutely aseptic conditions offers the best means of preventing subsequent septic changes. Furthermore, we may conclude that we possess in the "acid method" and "pulp digestion" two means of root-canal treatment which may be employed with advantage in all cases where thorough removal is impossible; caroid solvent being preferred on account of the ease with which it can be used, its non-irritating property and its power of penetration.

A few words about this agent. Caroid is a vegetable digestive obtained by mixing the ferments of the plant *carica papaya* and the fat-splitting ferment of *Colza*. According to extensive investigations by Prof. Chittenden this substance possesses marked power to dissolve organic substances; this effect is produced in acid, alkaline or neutral solutions, and in the presence of many chemicals, antiseptics and therapeutic agents; it exerts its peculiar power at a wide range of temperature and irrespective of changing media or environments. Caroid as a solvent of dead organic tissue has recently been used quite extensively for the removal of hardened and

tenacious secretions in the naso-pharynx and also the false membrane of diphtheria. In order to supply the profession with a stable solution the manufacturers have prepared a saturated solution of caroid in a menstruum which prevents its deterioration, calling it "caroid solvent."

The laudatory articles which appeared in medical journals suggested the use of this liquid as a substitute for papoid in the treatment of root canals, and the surprising results obtained during the first series of experiments induced me to use it in a large number of cases of putrescent root canals which presented themselves in the college clinic. I have the record of eighteen cases, but will simply state that the good results obtained from the use of caroid solvent, the ease with which it can be applied, the penetrating power of this digestive upon all organic tissues present in the root canal and dentin, giving to the latter a whitened appearance as though it had been bleached, demonstrate the usefulness of this method of treating root canals.—*Cosmos*.

TO RESTORE THE CUTTING OR GRINDING SURFACES OF ABRADED TEETH WITH GOLD. By Dr. F. M. Smith, New York. Read before the New York Institute of Stomatology. First separate the tooth to be restored from those on either side of it, so that a separation equal to B. and S. gauge No. 25 is secured. If only one tooth is to be restored, grind off sufficiently from the cutting edge to accommodate whatever thickness of restoration you desire to make. The tip or restoration should be at least two thicknesses of No. 28 gauge. After grinding down, as mentioned above, bevel the cutting edge very slightly all around, just sufficient to take off the sharp edge. Drill holes into the cutting edge on either side of the pulp an eighth of an inch deep, more or less, as the case will permit. Usually cases requiring this work are not very sensitive, owing to recession of the pulp. These holes, for an upper central incisor, should be the diameter of the pin of an ordinary rubber tooth (not the head of it); smaller teeth, pins in proportion.

Take 34 to 36 gauge pure gold, and burnish over the surface to be restored, being sure to have it run over the edge slightly, like the cover of a box. This is very important, and for it the separation was made. Ordinarily a wood point is the best thing with which to adapt

the gold to the tooth, the gold being very soft. A wad of bibulous paper pressed down with the wood is of assistance in the beginning. Then press with the wood point all over until a perfect adaptation is secured. When this has been done the dents in the gold show where the holes have been drilled in the tooth. Take a sharp point and pierce the gold for both pins. Take pure platinum wire exactly the size of the drill used. Make the ends small or slightly pointed, and press through the pure gold to the bottom of the hole. Often it is possible without waxing to withdraw the pin and gold together. If this can be done, hold underside of the pin with tweezers, apply minutest piece of 22-carat solder to the pin where it passes through the gold, hold over a small Bunsen flame or alcohol lamp and melt the solder. If the hole is no larger than the pin the solder will not run to the underside.

Now place on tooth and carefully press to place as before with wood point, being very careful that the edges fit perfectly. Put second pin in place and dry gold and pin; then apply brittle wax (made by heating equal parts of beeswax and gum dammar and stirring the same together while hot, then allowing to cool), remove gold carefully, invest, and solder second pin. Replace on tooth, again carefully press to place all over, cut pins off just at height finished piece should be, apply brittle wax as high as pins, carefully remove, paint under side with rouge and invest.

Have some 22-carat solder rolled very thin, cut size of tip and punch holes for pins. Put a minute quantity of borax on pure gold, drop solder over pins, prepare 22-carat plate same as piece of solder, drop in place, blow broad flame over the piece, and the solder will flow and the 22-carat gold will settle in its bed. Repeat the layers of solder and gold until you have the required height.

Remove investment, and if there is the remotest particle of solder on the under side, throw the piece into your scrap tray and begin again. If the minutest attention has been given to all the details it will not be necessary to throw the piece away. Supposing it fits perfectly, take off and finish roughly out of the mouth. It is more pleasant for the patient. Apply dam, mix a small quantity of oxyphosphate the consistency of cream, carry to bottom of holes with a fine smooth broach wound with a particle of cotton, put drop of cement on end of tooth, press tip to its place, and let patient bite it solidly home. Keep it there until the cement is set. Finish at next

sitting as perfectly as possible, and you have the strongest and best repair that can be made for the case.

With a little practice the same method can be successfully employed in incisor teeth, when both corners are broken off, necessitating the carrying of a gold filling if one is made from the gum line on the mesial down to and across the cutting edge and up to the gum line on the disto-approximal surface. If the pulp is living in such a case the piece will prove a good one. If dead, with so much of the tooth gone, probably a well-made porcelain crown would be better. The success of this work depends upon absolute attention to details and perfect fit.—*International*.

PACKING AMALGAM IN CAVITIES IN THE PROXIMAL SURFACE. By E. K. Wedelstaedt, D.D.S., St. Paul. The DENTAL DIGEST for August, 1902, contains a short essay on packing amalgam in cavities in the buccal surface. In considering the subject I called attention to the necessity of using much care in packing amalgam. Reasons were given why the burnisher should not be used, and something was said about using amalgam pluggers of different sizes. Reference was also made to the results of some experiments on which I based the ideas advanced in that essay. In considering this matter of packing amalgam in cavities in the proximal surface, I ask that the reader familiarize himself with the ideas contained in the first essay written, so that he can better understand the views expressed in this.

Let me consider the last operation I made with amalgam in the proximal surface. The cavity was in the disto-occlusal surface of a lower right first molar. The teeth and gums were prepared for the reception of the rubber dam, which was then adjusted. The crowns of the second and first molars, as well as those of the second and first bicuspsids, were exposed when the dam was adjusted. The cavity involved fully two-thirds of the proximal surface. The cavity was so prepared that the filling would be seated on a flat gingival seat. The cavo-enamel margin was at right angles to the axial wall. Lateral or parallel grooves or undercuts were entirely avoided. Anchorage for the filling was obtained by cutting a flat seat or step on the occlusal surface, and giving it the shape of a dovetail. When the cavity was finally prepared a matrix was made from a piece of copper, one-fiftieth of a millimeter thick. This was fitted around the

tooth, so that it extended from the buccal to the lingual groove. A Wedelstaedt tie secured it. The amalgam pluggers were then fitted to the cavity. The alloy was mixed and kneaded, and then packed into the cavity. Four pieces of amalgam were used. After the cavity had been filled the amalgam was left absolutely alone for about three minutes. It was examined and found to be very hard.

The ligature holding the matrix was then cut and removed, and the wings of the matrix turned back toward the second molar, thus exposing the amalgam at the distal angles. With a sharp knife the amalgam was trimmed from the main body of the filling toward the cavo-enamel margin. The matrix was then grasped and forcibly withdrawn. The trimming was continued until the filling was of the desired form. The point of contact with the adjacent tooth was not disturbed. The trimming was at all times away from it. When the trimming with the knife was finished a "medium" strip was passed through the interproximal space, to the gingival of the contact, to remove any sharp edges that had been overlooked. This completed the trimming of the proximal surface. The occlusal surface was cut to form with a pair of sharp rapid excavators, three millimeters in diameter. The dam was then removed, correction of the occlusion made, and the patient dismissed. At the next sitting the filling will be polished.

Why was it that parallel grooves were not cut? Why was the contact not disturbed while trimming the filling? In answer to the first question let me say that parallel grooves are at all times a menace to the strength of the tooth, and more often than not lead directly to the loss of the filling. We cannot pack filling material into grooves or undercuts as we can against a flat surface. During the past six or seven years I have on several occasions been compelled to remove a quick-setting amalgam filling which I had made in some proximal surface. Where small convenience pits had been made in the bucco and linguo-gingivo-axial angles, I found that these, trifling as they were, were more than sufficient for every purpose. Many of the quick-setting amalgams become very hard, and when much stress is placed on the filling there is a chance for fracturing the tooth where it has been weakened by making large and deep undercuts. Very often enamel cracks and black surfaces are observed beside these weak places. In view of these facts and the further one, that undercuts do not serve to add stability to a filling,

and tend only to weaken the tooth, they may as well be done away with when occlusal anchorages are made.

The point of contact was not disturbed in trimming the amalgam, for the reason that in polishing the amalgam the filling is always shortened a little mesio-distally. I prefer to do this at the time the filling is polished, and then I have some definite idea of its size. By reducing the size of the filling mesio-distally at the point of contact when trimming the amalgam, and then making a second reduction when polishing the filling, the exact contour desired is not always obtained. Therefore, I feel that it is better to let the point of contact alone till the filling is finally polished.

There are a number of things to be said on the subject of making amalgam fillings. But these can only be touched upon, for it is impossible to go into any great detail. The great majority of dentists seem to be of the opinion (I am judging from the operations I see) that "amalgam fillings are cheap things anyway; so I just squash them in." This, at least, is how one man expressed it. This is a grave mistake, and if followed is apt to lead to all kinds of trouble. It is far more difficult to make first-class amalgam fillings than it is to make first-class gold fillings. Many others seem to think that amalgam fillings need not have any special cavity preparation, need not be trimmed or polished; that amalgam placed in the proximal surfaces need not or cannot be contoured. Another class of dentists have been taught that as decay cannot take place in the margins around fillings made of amalgam, principles of extension for prevention can be ignored. A larger class still have been told that amalgam fillings made on decalcified dentin cause a recalcification of the decalcified mass.

When our knowledge was limited and our theories were based on suppositions, it was perhaps all very well to have sophistry of this kind brought to our notice. But with the development of our knowledge we know definitely that such things are wrong. It is our duty to become familiar with all the knowledge as it is developed for our consideration, and not follow along a beaten path, the end of which no man knows.

Recently a number of essays have appeared in which the writers allege that they are fully acquainted with the methods of extension for prevention, but they assert that they do not follow them, for their patients cannot afford to pay for the operations. This is very

peculiar reasoning. I should like to ask those who have had the courage to incorporate such thoughts in their essays and follow such methods in their daily operations, how they would like similar treatment from a surgeon? If a thing is worth doing at all it is worth doing well. If you cannot do the teeth on which you operate some little good, do not be guilty of doing them harm.

Before me lies a dental journal, dated May, 1902, from which I copy the following: "Where decay is rapid in growing mouths, or for that matter, at any period in life, gold as a filling material is contraindicated. It is better and safer practice to resort to either gutta-percha or amalgam to tide over these years." I would reply briefly that amalgam as a filling material has its place and use. It does not nor can it ever take the place of gold. The use of the two materials is separate and distinct and should not be confused. Where there is evidence of rapid decay going on gold should be used, for the simple reason that we all know what we can do with it. Many think that they know, but few really know what can be done with amalgam. Regarding the usefulness of gutta-percha, I can say only that it also has its place, and this place is not where gold or amalgam should be used.

In the selection of a filling material judgment is as necessary as it is that some study of conditions is at all times necessary prior to preparing cavities. If this is not given the case, the operation might just as well not be made, for in too many cases it is a temporary expedient only, which more often than not is quickly followed by something permanent from the hands of a more intelligent dental surgeon.—*Summary.*

ANEMIA IN CHILDHOOD. Dr. W. C. Hollopeter commented on the fact that the period of primary dentition was often a time of ill-health, complicated by improper food, sooner or later resulting in disturbance of the child's blood, producing marked anemia. After brief reference to the anemias of acute diseases and specific blood changes, the author stated that he believed dental decay, with consequent pus formation and septic involvement of the alimentary tract, was the foremost cause of anemia in children and most frequently overlooked by the general practitioner, although it is pretty generally recognized by the pediatricist. The care of the first teeth is too often neglected, resulting in hyperemia of the oral cavity,

with numerous alveolar abscesses and the consequent passage of pus into the stomach. With the teeth in this condition proper mastication is impossible, and this results in derangement of the gastrointestinal tract and general catarrhal inflammation, producing irritability and laying a foundation for anemia that may require years of correct living to correct. The difficulty of curing chronic gastrointestinal catarrh was discussed and the necessity of preventing this condition emphasized. This can be accomplished only by much medication, careful regulation of the diet and regime and careful toilet of the teeth. The period of second dentition is a time of great importance, as the nervous system is then unstable and particularly liable to be affected.

Among the conditions remarked as a result of the neglect of the teeth were stomatitis, ulceration, sloughings, gangrene, pyorrhea alveolaris, periostitis, alveolar abscesses, necrosis, recurrent tonsillitis, pharyngeal otitis, glandular inflammation, cellulitis and possibly meningitis. The opinion of a former coroner of Philadelphia, that 50 per cent of all deaths in children coming under his observation were due to oral sepsis, was quoted.

A second frequently unrecognized factor is mouth-breathing, due to nasal stenosis following whooping-cough, measles, influenza, resulting in catarrhal inflammations and hypertrophied turbinated tissue, serving to block the channel, which is indicated by the characteristic facies due to a deficiency of oxygen and causing anemia. The value of careful toilet of the nose and throat during the disease in order to prevent these conditions was remarked.

As a third causative factor was mentioned eye-strain, especially during school life, which is often due to poor print and defective light and ventilation. Many of the conditions of so-called headache, catarrh of the stomach and nausea are really due to eye-strain, and the reason better results in treatment are not secured is owing to the fact that therapeutic measures are directed to the manifest symptoms, while the real cause of the condition is unsuspected. In concluding, the author stated that he believed asepsis of the mouth was of as much importance to the physician as was asepsis to the surgeon.

Discussion. *Dr. E. E. Graham* stated that in considering anemia in children we should take into consideration the fact the composition of the blood in childhood is very different from its composition

in the adult, the proportion of the white blood corpuscles in the former being far in excess of that in the latter. It was also believed that in anemia there were substances in the blood intimately associated with many of the diseases. While splenic enlargement is an important factor in the diagnosis of anemia in the adult, cases have been observed in which this organ was markedly increased in size in children, yet where the anemia was only moderate. Almost any disease can produce a certain amount of secondary anemia in a child, and this he attributed mainly to two causes, decrease in the production of blood, caused by poor food, improper hygiene and poor assimilation, and increased destruction of the blood cells. The latter factor is particularly exemplified in nephritis, diphtheria, tuberculosis and cases of chronic suppuration and effusion, especially pleural effusions, and he cited a case in which three pints of pus had been removed by means of the aspirator, and the anemia was as marked as in a case of pernicious anemia. In such cases the hemoglobin is proportionately reduced as compared with the red blood cells, and in some cases the reduction is excessive, and leucocytosis may or may not be present. It is important to treat rather the cause of the disease than the disease per se, and prophylactic measures, such as correct hygiene and diet, to prevent the development of the cause, were recommended. Iron and arsenic were regarded as the most valuable drugs. The prognosis was felt to depend on the age of the child and the cause; the younger the child, the graver the prognosis. While dentition per se was not regarded as a very important factor in the production of anemia, the escape of pus into the stomach from the gastro-intestinal tract, and the consequent irritation of the latter, will account for a considerable proportion of the cases.

Dr. Samuel Wolfe, while he recognized the value of proper preservation of the teeth, and felt that carious teeth and bad hygienic oral conditions were no doubt responsible for some of the anemias in childhood, still believed that in many instances an impaired and defective condition of the blood resulting from heredity or other cause often led to decay of the second teeth. He felt that while proper hygiene of the mouth and teeth would prevent a portion of the vicious circle, we must go deeper into the causation of the condition in order to bring about a rapid cure, particularly in cases resulting from eye-strain, phimosis, and defective nutrition and metabolism. This fact was substantiated by the frequent occurrence of

anemia in children with defective vitality and weakened conditions. Malaria was also felt to be a frequent cause and should be considered in all cases.

Dr. H. Brooker Mills believed faulty dentition as a cause of anemia should be divided into three classes, absorption of pus due to suppuration of the gums; indigestion due to insufficient mastication, which is in turn due to bad teeth, and indigestion due to insufficient mastication, when the teeth are good. He felt that the larger proportion of the cases came under the latter class. A case was cited in which the patient had died of autointoxication due to constipation, attributed to indigestion due to faulty dentition, or rather improper use of the teeth, which were in good condition. Another case was noted in which gradual bleeding from the gums—presumably due to some purpuric condition—produced very profound anemia, finally resulting fatally. Eye-strain and mouth-breathing were regarded as frequent causes of anemia, and in many instances correction of these conditions had relieved the other symptoms.

Dr. William H. Good felt that fermentation going on in the mouth caused by constant eating, especially of sweets, was responsible for the production of a certain amount of the dental caries, and that if this dietary indiscretion were corrected, the formation of the conditions in the mouth and gastrointestinal tract would be prevented.

Dr. Hollopeter, in closing, stated that he had in mind dental caries in relation to second dentition, rather than to primary dentition as a causative factor of anemia, and he also felt that neglect to use the teeth was probably a more important point than had been generally recognized.—*Jour. Am. Med. Assn.*

FORCIBLE METHOD OF COLLECTING A BILL.—A dentist in Iowa was recently arrested and fined for beating up a patient who refused to pay a bill.

TO GIVE PORCELAIN THE APPEARANCE OF A DEAD TOOTH.—Burning a little sulphur on porcelain gases it and deadens its appearance.—*W. A. MILLS, Cosmos.*

VULCANIZATION OF LARGE PIECES.—*Dr. Martin* vulcanizes large prosthetic pieces at a temperature of 311 deg. F. for two hours, and never has to record cases of porosity.—*Australian Jour.*

QUININ AS A STYPTIC AND ANTISEPTIC.—In aseptic wounds quinin absolutely stops parenchymatous bleeding, and has the additional power of rendering innocuous any germs that may have been conveyed into the wound by the operator's hands.—*Am. Jour. Med. Sc.*

Letters.

THE BOSS SUDDENLY BECOMES FAMOUS.

(AS TOLD BY THE OFFICE BOY.)

A man he come in the Offis one mornin', an' he wasn't dressed not as well as the Boss, even. Says he, "Kin I see the Doctor?" An' then he took out his Card, an' it had a big set of Teeth in one Corner, an' they was all Gilded. An' it said on it, "Doctor H. S. Rurel, Surgeon Dentist, Coonville, Tenn. Office next door to Ryan's Cooper Shop. Gold Fillings warranted for Life." He had a Big carpet Bag in his hand, an' it didn't take me long to size him up fer a Blood-Raw Member from the Scrub Oak region.

So I took his card in to the Boss, an' presently the Boss he Come Along In, to see what was the pertick'ler Outcry. The man he'd set down off in a Corner, like he was afeard he might strain the Furniture, an' when the Boss Come in he riz up an' made a Low Bow. Says he, "It's a Grate Privilege to Meet a distinguished member of our Perfession, like you, Doctor, an' I hope I reelize the Honor I'm enjoyin'." Then he Bowed way down to the Floor, agin, an' stood waitin' fer the boss to ast him to take a Seat. I seen right away that the Boss was Offul Took Aback. He looked jis' like he did the mornin' he was workin' for Mis' Dawson (she's the Ritch Stove Foundry's wife, over the river), an' Mis' Contour yelled at him from out in the Kitchen, to go to the Grocery an' git her a Nickel's Worth of Pepper.

But presently he seemed to recover his Presents of Mind, fer he cleared his throat an' says he in Gruff Tones, "I'm always glad to learn that my friends approve of my Perfessional Record"—like he'd inventèd a new Plugger, er Clamp. Then he sized the Stranger up, like he wondered what'n thunder it all meant. The man he stood there gazin' respectfully an' admirin'ly at the Boss, an' kind o' Suckin' the edge of his Hat-Brim.

So says the Boss, "Set down an' have a Seat," in a Condescendin' Tone of Vois. So the Stranger he set down, an' Silence Rained fer a Spell, like it was a Girl gittin' Sparked, an' the Feller wishin' he could think of somethin' to Say. After a Long Wait says the Boss—kind o' feelin' his Way, I reckon—"how—how did you happen to—er—to heer about me?" like he didn't know yit what he'd Done.

Then says the dentist—Dock Rurel, I said his name was—says he, “Why, what a Question, Doctor! When a man what’s got a World-Wide reputation asts me sech a question as that, I ain’t got but one conclusion: to wit, that he’s doin’ a little bit of a Funny Turn.”

So then he Laffed, an’ the Boss he never even Smiled, fer he knowed he’d got to Act Up to his reputation. I could see his Chist a-heavin’ out, an’ his chin went up two er three Notches. He begun to heave his Vois from the bottom of his Stummick, like the Governor of the State done once, when he was makin’ a political Speech, in front of our Offis. Every once in awhile he’d Turn Round an’ say to me, “James, the Door,” when they wasn’t nobody ringin’, jis’ to show his Importance, I reckon.

So then says Dock Rurel, “It mus’ be Offul Gratifyin’ to know the Eyes of the hull Perfession is fixed on you, Dock. At the same time, it mus’ be a Offul Responsibility, feelin’ that every movement o’ yourn is observed in far distant quarters, as well as right here at home. Still, that’s what men in all high positions has to Pay, fer bein’ so Exalted. It’s what I’d call a Mixin’ Together of the Sweet an’ the Bitter, Dock.”

Dock Rurel he Got Up an’ took a seat a little nearer to where the Boss was a-settin’, like he wanted to see him Closter, an’ be able to describe him better when he went back home, and people ast him what kind o’ lookin’ man Dock Contour was. It all seemed kind o’ Queer to me; I hadn’t Heered that the Boss was considered sech a Wonder. But you can’t always tell, like the boys over the River thinks I’m the Champeon of our Ward, an’ I ain’t never licked only two fellers of my size, while three has Licked Me.

Jis’ then the bell rung, sure enough, an’ I opened it, an’ in walked Dock Puffy. That was a Nother surprise, fer Dock Puffy he don’t hardly ever come in our Offis, bein’ in a Higher Class than the Boss. So the Boss he Shook Hands with him, an’ ast him how practice was, an’ was Collections good, an’ Dock Puffy he said he didn’t know, ’cause he’d got a Collector that looked after them matters, an’ he never seen him exceptin’ when he’d Come In the offis an’ ast him whether he should buy another House, er would he ruther have him buy some Standard Oil er Electric Stock.

All this time it seemed like Dock Puffy he never noticed the stranger, Dock Rurel, an’ the Boss he never thought to Introduce him. I think he was too Flustered, havin’ Dock Puffy come in.

But after a Spell Dock Puffy he seemed to Discover somehow they was a Stranger present, an' he put up his eyeglass, an' he looked him Over, like he was a Prize Hog at the County Fair. The Stranger didn't seem to make no Impression on him, though, fer he went right on talkin' about Investments, an' how him an' Rockafeller an' a lot of the other Bloods was a-goin' to charter a Vessel an' go on a Pleasure Trip up to the North Cape, in Norway, the comin' Summer, an' he didn't want it Give Away, fer fear his Patients would raise a Muss ef they Heered he was goin' out o' Town that long.

So then Dock Rurel he struck up a Conversation with Dock Puffy, not waitin' fer no introduction, an' says he, "It's a wonder to me that you Folks livin' right here in the same town with our Friend that me an' you has so Happily met, this mornin', ain't done more than what you seem to of done, to show your appreciation of the important service he's done the Perfession. If it was down in Coonville, where I come from, they'd Sarynade him, anyhow, an' I wouldn't be Surprised ef they didn't raise a Monymint to him."

That seemed to Ketch Dock Puffy's attention, an' says he, "Who do you reckon he is, that you want to make sech a Fuss over him? What's he done? Blamed ef I've heered." Then Dock Rurel, says he, "W'y ain't he the Dean of your Dental College, an' ain't he the Leadin' Dentist of your city?" An' says Dock Puffy, "I hain't heered as yit who *is* considered the *Leadin'* Dentist of our City, but sense you've ast I may as well own up that I'm the Dean of the Dental College, myself."

When he said that it was a Puzzle to see the Expression on Dock Rurel's face. Says he, "May I ast your name?" So then Dock Puffy he handed him his card, with a Imperial Air. Dock Rurel he took it an' he read it careful, an' he looked mos' Offul Mystified, an' says he, "Is they two Dock Puffys?" Then says Dock Puffy, "Not as I know of." So then Dock Rurel he blinked a Spell, like he was all Twisted Up, an' then a Idee suddenly seemed to seize him. He riz up an' ast the Boss fer one of his Cards. Then the Boss he give him one, an' as soon as ever he read it says he, "I see they's been a Mistake. I've come to the Wrong Offis. Is your name really Dock Contour?" The Boss he looked like he thought it was some game to Rig him, but he says, right away, "Of course my name's Contour. What did you reckon it was?"

"I reckoned it was Puffy," says Dock Rurel. "Dock Puffy is the name I had in Mind, an' I thought this was Dock Puffy's offis. I ain't never heered of no Dock Contour, an' the dental journals don't make no mention of sech a Practitioner."

Dock Rurel he looked like he reckoned the Boss had knowed better all the time, only he hadn't Let On, an' was a-tryin' to git somethin' that wasn't rightly comin' to him. In fact, he give the Boss a look that said as plain as Words, that he considered him no better than a Hoss Thief er a Bugler, deceivin' him thataway. To make the matter more Aggervatin' he went across the Room an' took a Stand beside Dock Puffy, like it was arrayin' the hosts of Heavin agin the Hordes o' Satan.

The Boss he ain't so Sudden to take Offense, though he's Quick Tempered, when it comes to Jeerin' Words, er Outspoken Sass. But now he seen middlin' quick, that he was bein' Snubbed an' unjustly humbled right on his own Stamping-Ground, an' he turned in without delay to learn this Hayseed a lesson. The Boss he don't Weigh over a Hundred an' Forty, but anybody could easy see Dock Rurel wouldn't raise the beam at over a Hundred an' Fifteen anyhow. So then the Boss he seen it was his Meat, an' he Knowed sech a Chance wasn't likely to happen fer a Long Time, most of the Local Dentists bein' Middle Weights.

So says he in Tones more in Sorrow than in Anger, "It saddens me to discover evidences of sech Depravity of Natur in a Young Man fresh from the Soil. I had Hoped your Country Breedin' would preserve the Innocence of your Erstewhile Infantile Character, but this exhibition of Gall satisfies me that nothin' but Drastic Measures will suffice to Purge out of you the Dross your System seems to of Accumulated durin' the short hours of your Stay in our City. I find myself the Instrument Providentially appointed to set you Right, to apply Disciplinary measures fer your Reclamation." The Boss uses Offul High-Soundin' words, when he's git-tin' ready to do anythin' out o' the Usual.

So then he suddenly seized Dock Rurel by the neck-band an' the Slack of his Trousers, an' he Rushed him out into the Yard, an' Soused his Head in a Tub standin' under the Pump. Dock Rurel he was Offul Took by Supprise but he had the Presents of Mind to Yell, an' after he'd been ducked nine or ten Times he Broke

Loose an' made over the fence, Head First, without stoppin' fer his Hat er nothin'.

The Boss he stood a-glarin' after him, an' Dock Puffy laffed out loud, the first time I ever Heered him. After Dock Rurel was Clean Gone the Boss he went over an' Shook Hands with Dock Puffy, Offul Solemn. Says he, "The Morals of the Odontologicostomatitital Society mus' be preserved at all Hazards, Dock Puffy. Let us hope this painful Spectacle will not Linger to disturb our Dreams this Night." But Dock Puffy he got done Laffin' presently, an' then he explained that he didn't see no Special Occasion for treatin' the Feller thataway, seein' as it was after all a Compliment to the Boss to be Mistaken fer the Leadin' Dentist in the City. "How he happened to make sech a Egregious Mistake though, I don't noway see," he added.

The Boss he's got a Good Deal of Respect fer Dock Puffy, but that was a little too Much. It so Happened that the Boss was washin' his hands at the Tub, jis' as Dock Puffy said that, an' says he, "What do you mean by that remark, sir!" An' then like he'd been Suddenly Seized with one o' them Frenzies that ketches him lately, he up with a big Sponge layin' in the water-trough, an' he Banged Dock Puffy right in the Mouth with it. The water Squshed all over Dock Puffy's face an' his clothes, an' he was a Sight! It was a Thrillin' Moment, an' I looked to see a Set-To wuth goin' a Thousan' Miles to Witness, them two bein' near the Same Weight. But to my Supprise an' Disgust Dick Puffy he looked kind o' Stunned a Minute, an' then he walked out in the Kitchen, swabbed his face on the dish-cloth, an' act'ally Snuck Off the back way, never lookin' back.

Cincinnati.

FRANK W. SAGE, D.D.S.

READING IN BED.—Dr. Carl Seller argues that the recumbent posture allows more rest of all the bodily functions, and relieves the congestion of the eyes; it is therefore a very good position for reading.

CYST OF SUPERIOR MAXILLA.—Maass reports the case of a boy of twelve years old, in whom there developed a tumor filling the canine fossa. This growth appeared eighteen months after the extraction of two teeth for a periostitis at the root. This tumor was covered with a thin, bony plate. Exploratory puncture brought forth the contents, which were composed of leukocytes, cholesterine crystals, and pavement and cubical epithelium. The tumor was a cyst of the root of the tooth, due to a proliferated epithelial formation.—*Gaz. Heb. de Med. et Chir.*

The Dental Digest.

PUBLISHED THE FIFTEENTH DAY OF EVERY MONTH

At 2231 Prairie Avenue, Chicago,

Where All Communications Should be Addressed.

Editorial.

FILL UP THE QUESTION CARD.

The executive committee of the Illinois State Dental Society has sent a card to every member with the request that he will put on it any questions that occur to him, or any problems that come up in his practice prior to March 1, 1903. The cards are then to be mailed to Dr. C. J. Sowle, Chairman of the Executive Committee, Rockford, Ill.

The name need not be signed to the card, and, even if it is signed, it will be kept private and no one will know by whom the questions are asked. The questions will be answered by members of the Society capable of looking at the various problems in the broadest manner. The idea is a very good one, and if successfully carried out will be a most interesting and helpful addition to the regular program. We would urge every member to fill up the card.

ODONTOGRAPHIC SOCIETY OF CHICAGO CLINIC.

One year ago the Chicago Odontographic Society decided to celebrate its fifteenth anniversary, which occurs February 16-17, 1903, by giving a clinic unsurpassed in the history of the dental profession. Various committees were accordingly appointed and the work begun. It was the intention from the start to make the meeting national in character, so gentlemen of international reputation were invited to read papers and give clinics. The program committee, specially appointed for the purpose, decided to have five men from each state, so as to give the clinics great variety and let them represent the methods of the whole country. Already thirty-six states can be counted on for a full representation. The papers are not many in number but are of unusual interest and excellence. The essayists are Drs. E. C. Kirk, Philadelphia; R. Ottolengui, New York; W. W. Evans, Washington; A. E. Webster, Toronto; H. P. Carlton, San Francisco.

A feature of special interest will be the exhibits. The committee in charge of this work has made every arrangement for the convenience of the exhibitors and it is confidently expected that a greater number will be present and that the character and variety of display will be better than at any previous meeting.

All railroads have granted a rate of a fare and a third on the certificate plan.

Large delegations are coming from several States, many notables will be present, and every indication points to the biggest meeting ever held in the history of dentistry. The affair will wind up with a big banquet at the Auditorium, which promises to be a memorable event. We congratulate the Society that conditions are such as to make so magnificent a meeting possible, and we would urge the profession all over the United States to attend. Those who stay away will miss more than they realize.

Dr. Geo. B. Perry, chairman of the executive committee, or Dr. C. E. Bentley, chairman of the program committee, will be pleased to give any information pertaining to the exhibits or program.

OFFICE RIGHTS.

When will dentists not bite at office rights? When will dental journals not assist such fakes? In the second issue of the *American Dental Journal* appears an editorial advertisement for Dr. Carmichael's system of crown and bridgework. A nice way to open the first volume of a journal! It is rather an apology for Carmichael, because it says he teaches the dentist how to do the trick for fifty dollars, while as a matter of fact, Carmichael has his method patented, he says, and sells you office rights for one year or for perpetuity. Is this teaching? What a jolly! There is nothing to the system, and at its best it is not much better than swinging bridges on open-faced crowns, *e. g.*, grind the lingual cusp of a molar or bicuspid away considerably to allow for two thicknesses of gold, and cut a groove deeply through the sulcus and down the mesial and distal surfaces, burnish pure gold into this groove and over the ground portion, and then swedge 22 karat plate to this to make the proper contour, thus the abutment is made so that no gold shows on buccal surface. Fifty dollars, please! This is the same as Dr. George Evans of New York demonstrated at the practitioners' course four or five years ago in Toronto. It is whispered round that Carmichael found takers in Toronto. Doubtless these were the men who didn't think it worth while to attend Dr. Evans' course. It didn't cost enough. As usual in such cases, a long list of testimonials was presented. A personal

letter of a prominent professor in a Western dental college was "judiciously displayed," using the words of the Niles' Michigan Hospital fake. Does anyone suppose this gentleman paid his fifty? Not much—he gave his testimonial, and suckers were caught. "A sucker is born every minute." What's next, and who's next?

We reprint the above editorial from a recent issue of the *Dominion Dental Journal*. Greatly to our surprise, we learn that several members of the Protective Association throughout the country and even in Chicago, as well as many dentists who are not members, have bought office rights from Carmichael. We have repeatedly urged and requested members of the Association never to purchase a license, buy office rights or pay royalty without consulting us. In the present case, had the members written us for advice they could have saved their money and they would not have contributed to a cause which we believe is not legitimate.

The editor very properly criticises those dental journals and practitioners who aid by testimonials these vendors of office rights. An alleged new crown has recently been patented, and the licensee is inclosing with the blank office-right application a list of testimonials from prominent men. A dentist of Texas writes us as follows, "This is the kind of stuff we are receiving down here in the southwest all the time. What encouragement have we to be honest, honorable, ethical members of the profession when such a scheme as this, apparently at any rate, is indorsed by men who are supposed to be examples for the younger members of the profession?" We quite agree with the sentiment expressed by our correspondent.

PLANS OF THE DENTAL PROTECTIVE ASSOCIATION.

At the recent annual meeting the present officers were reelected, and a resolution was passed providing that the chairman should appoint a committee of seven, choosing representative men from various parts of the country, to consider the situation and devise ways and means of reorganizing the present Association or forming a new one. This committee will be named in the near future.

The circular sent to the members brought several hundred replies, most of them containing suggestions. It is impossible for the chairman to reply personally to all these letters, so he takes this opportunity of acknowledging their receipt and of thanking those members who sent words of encouragement and commendation. All those

suggestions which seem practicable will be turned over to this new committee.

What the present organization has accomplished is a good illustration of what could be done if the profession could be more generally interested. That the dentists of this country should have a permanent organization for defense is universally conceded. Any organization to be permanent must include larger and more varied interests than exist in the present body. This need was apparent to your editor several years ago, and at that time we formed a second association to interest a larger number, with the view of making it permanent. This move, however, did not receive the indorsement which we expected, so we abandoned the idea, and it is now up to the profession to decide what they wish to do and to carry it out.

The Protective Association has not interested nearly enough of the dentists, and there is nothing now to induce the non-members to join, so the membership list is not only not increasing, but is diminishing every year, owing to deaths or changes of occupation of the old members. There is no revenue, so the organization must of necessity go to pieces in a little while if not disbanded. No one regrets this state of affairs more than your editor, as the time and labor we spent in organizing the Association were almost as great as the work involved in taking care of the patent litigation for the past fifteen years.

Already various individuals are making their plans to bleed the profession on patent devices, office rights, etc., and no men are an easier prey to such schemes than the dentists of this country. Before the Protective Association was organized we were importuned to take stock in and become a part of the International Tooth Crown Company. We suggested that if the dental profession would band together the Company could be prevented from collecting royalty, and were met with the reply that "The dentists never had and never would band together, and for this very reason royalty can be collected on worthless patents just as well as on legitimate ones." If we had not already had experience in attempting to get the dentists to cooperate we would think it an easy matter to band them together, but our experience has lessened our hopes and dampened our enthusiasm, and we deem it impossible for any individual or even a few men to accomplish this most desirable object, yet if the thinking men of the profession could be aroused a permanent organization could be perfected.

Notices.

INDEX FOR 1902.

The index for Vol. VIII of the DENTAL DIGEST will be mailed with the issue of January, 1903.

OHIO STATE DENTAL SOCIETY.

At the thirty-seventh annual meeting of the Ohio State Dental Society, held at Columbus, Dec. 2-4, 1902, the following officers were elected: President, J. B. Beauman; 1st Vice-president, J. F. Stephan; 2d Vice-president, W. T. McLean; Secretary, S. D. Ruggles; Treasurer, C. I. Keely.

WISCONSIN STATE BOARD OF DENTAL EXAMINERS.

The semi-annual meeting of the Wisconsin State Board of Dental Examiners will be held at the Hotel Pfister, Milwaukee, Jan. 26, 1903. All candidates wishing to take the examination to practice dentistry in this state will present themselves at 9 a. m.

J. J. WRIGHT, Secy., Wells Bldg., Milwaukee.

DISTRICT OF COLUMBIA DENTAL SOCIETY.

The thirty-sixth meeting and banquet were held at Washington, Dec. 12, and the following officers were elected: President, L. F. Davis; Vice-president, W. D. Monroe; Recording Secretary, S. W. Bowles; Corresponding Secretary, Wms. Donnally; Treasurer, M. F. Finley; Librarian, H. C. Thompson; Essayist, W. W. Evans.

ODONTOGRAPHIC SOCIETY OF CHICAGO.

This Society will celebrate the fifteenth annual meeting with a two days' clinic, Feb. 16-17, 1903. Papers of great interest will be read by representative men, and there will be more than one hundred and fifty clinics, demonstrating practical methods of all kinds. The profession everywhere is cordially invited.

C. N. JOHNSON, President.

F. H. ZINN, Secretary.

RESOLUTIONS BY LOS ANGELES ASSOCIATION OF DENTAL ALUMNI.

At a regular meeting of the Los Angeles Association of Dental Alumni, held Tuesday evening, Dec. 2, 1902, the committee on resolutions submitted the following, which were adopted, upon the death of Dr. Harry Hubert Herren:

Whereas, It has pleased the Great Creator of the Universe to remove from earth's trials and sorrows our beloved friend and colaborer, Harry Hubert Herren, a tried and faithful officer and member of this Association, it is meet and fitting that we should place on record our appreciation of his many virtues as a friend, and of his earnest and valued services to the profession

he loved. In the prime of life, full of energy and earnestness in professional work, he clung to duty long after the germs of disease had numbered his days among us. May his example of courage and cheerful submission inspire us along the pathway of life, and his manliness and friendliness ever receive our most profound appreciation and respect; be it, therefore,

Resolved, That by this sad event our Association has lost one of its most honored members, and the dental profession an earnest and progressive professional gentleman, a genial and fast friend.

Resolved, That bowing to the will of Him who hath given and now hath taken the spirit of our friend, freed from the dross of disease and suffering, and purified for the life beyond, we hereby express our heartfelt sympathy with his bereaved wife and aged parents; and be it further

Resolved, That a copy of these resolutions be spread upon the minutes of this Association, transmitted to his family, and published in the dental journals.

EDGAR PALMER,	} Committee.
W. R. HOLIDAY,	
H. D. REQUE,	

RESOLUTIONS BY MASSACHUSETTS BOARD OF REGISTRATION.

At a meeting of the Massachusetts Board of Registration in Dentistry the following resolutions were passed:

Whereas, In the sudden death of Dr. J. Searle Hurlbut the Massachusetts Board of Registration in Dentistry mourns the loss of one of its original members, who for nine years of its existence served with exceptional distinction, four years of which he was president; therefore, be it

Resolved, That as an examiner he displayed remarkable wisdom, fairness and judgment, and showed wonderful tact in his dealing with men.

Resolved, That in his contact with his associates on the Board his kindness of nature and generosity of heart will always be remembered with the warmest affection.

Resolved, That we extend our sincere and heartfelt sympathy to his widow in this sad affliction.

Resolved, That these resolutions be entered on the records and a copy be sent to the widow of the deceased and to the several dental journals for publication.

JOHN F. DOWSLEY,
GEO. E. MITCHELL,
THOS. J. BARRETT,
DWIGHT M. CLAPP,
GEO. A. MAXFIELD.

November 20, 1902.

HARRY HUBERT HERREN, D.D.S.

Died at Pasadena, Cal., Nov. 27, 1902, from tuberculosis, Harry Hubert Herren, D. D. S., age twenty-eight years. Dr. Herren was born in Smith

County, Kansas, March 20, 1874, and moved to Pasadena in 1886. He went to Chicago in 1896 to begin the study of dentistry in the Chicago College of Dental Surgery, from which he graduated in 1899. He moved to Los Angeles and took up the practice of his chosen profession, making a specialty of Orthodontia, and was associated with the Dental Department of the University of Southern California for two years as an instructor in that branch, when his health compelled him to resign. He was one of the most active members of the Los Angeles Association of Dental Alumni, and was elected its president in 1901. He was also a member of the Southern California Dental Association. He was married in Chicago to Miss M. Victoria Ackerman, who survives him.

It was a painful shock to the members of the Southern California Dental Association to hear of the death of their fellow-member, Dr. H. H. Herren.

It is but three short years since he came to Los Angeles and opened a dental office. He at once identified himself with our societies and became one of us. We recognized in him from the first a man of sterling worth and a dentist of unusual ability. He easily maintained this position and grew into the confidence of the public. He was ever ready to contribute of his means and of his skill to render more interesting and more profitable our professional gatherings. As a Society, as well as individually, we shall miss him, and feel his absence as a great loss.

The Society desires through its Committee to express its sorrow, and to extend its condolence to the bereaved friends.

Our hearts go out to the loved and now sorrow-stricken wife, his companion at many of our gatherings. To her we desire especially to tender our heartfelt sympathy, but at such a time words utterly fail to carry what we would put in them. We can only leave her to the great heart of our Heavenly Father.

J. D. MOODY,	}	Committee.
E. G. HOWARD,		
H. S. MILES,		

LATEST DENTAL PATENTS.

- 709,812. Mouth mirror, G. S. Bennett, J. W. Thatcher, San Francisco.
- 709,834. Dental gauge, C. R. Vanderpool, Grand Rapids, Mich.
- 709,973. Dental apparatus, L. Eilertson, Paris, France.
- 711,324. Artificial denture, W. P. Lacy, So. Boston, Va.
- 711,340. Mandrel, G. J. Paynter, Philadelphia.
- 711,827. Electric heater, J. Cook, J. M. Pumerville, Michigan City, Ind.
- 712,057. Annealing furnace, N. K. Garhart, Indianapolis.
- 712,526. Filling tool, P. C. Hammersmith, Buffalo,.
- 712,576. Dental instrument, J. F. McMath, Oakland, Cal.
- 712,716. Electric engine, O. H. and A. F. Pieper, Rochester.
- 712,813. Dental plugger, F. W. Korb, Cleveland.
- 713,040. Bridgework, E. L. Townsend, Los Angeles, Cal.
- 713,041. Band-fitting instrument, E. L. Townsend, Los Angeles, Cal.
- 713,103. Foot engine, F. Hurlbut, Chicago.
- 713,273. Matrix-crown, I. H. Alexander, Camden, S. C.

- 713,282. Dental chair, A. W. Browne, Prince Bay, N. Y.
- 713,319. Tool-holder, C. A. Lundberg, New York.
- 713,469. Dental appliance, G. G. Martin, Pecos, Tex.
- 713,470. Forceps, W. T. Martin, Yazoo City, Miss.
- 713,826. Dental Handpiece, J. D. Wilkens, Chicago, assignor to Dental Protective Supply Co.
- 714,105. Dental heater, G. Evans, New York.
- 714,373. Electric furnace, A. M. Hewett, J. C. Smith, Chicago.
- 714,613. Handpiece, A. W. Schramm et al., Philadelphia.
- 714,938. Dental oven, J. A. McClelland, Chicago.
- 714,983. Dental instrument, C. P. Wilson, Newton, Mass.
- 715,182. Dental flask, W. Waegel, Reading, Pa.
- 715,216. Producing amalgam, A. Shaw, R. Stevens, Cambridge, Mass.
- 715,447. Dental plugger, J. D. Wilkens, Chicago, assignor to Dental Protective Supply Co.
- 715,492. Dental bridge, H. A. Littig, Davenport, Ia.
- 716,676. Cement injector, H. L. Cruttenden, Northfield, Minn.
- 716,677. Cement injector tube, H. L. Cruttenden, Northfield, Minn.
- 716,781. Dental oclussor, C. L. Stocks, Greenville, Tex.

News Summary.

- J. J. HERNDON, a dentist at Bennettsville, S. C., died Nov. 10.
- J. F. WRIGHT, a dentist at Clinton, Ia., died suddenly Dec. 17.
- S. A. SMITH, a dentist at Maysville, Ky., committed suicide Dec. 7.
- M. TANNEHILL, 62 years old, a dentist at Confluence, Pa., died Dec. 11.
- CHARLES DIPPOLT, 69 years old, a dentist of Trenton, N. J., died Dec. 15.
- G. A. ANDREWS, for several years a dentist at Lyons, N. Y., died Nov. 27.
- J. K. BICKELL, 62 years old, a dentist at Andover, Mass., committed suicide Nov. 25.
- H. M. RAGON, 62 years old, a dentist at Bath, Me., died Nov. 22, after a short illness.
- J. B. WORLEY, 55 years old, a dentist at Monmouth, Ill., died Dec. 7, from heart failure.
- H. D. ATKINSON, a young dentist of Richmond, Va., died Nov. 24, from typhoid fever.
- F. H. SMITH, 40 years of age, a dentist at Sewickley, Pa., died Dec. 11, from pneumonia.
- M. W. SMALL, 86 years old, a dentist at East Providence, R. I., died Dec. 6, from pneumonia.
- C. A. BUDD, forty-five years old, a dentist at Muncie, Ind., died Nov. 22, after a short illness.
- G. A. TABER, 71 years old, a dentist at Boston, Mass., died suddenly of heart disease, Nov. 16.

L. C. FULLER, a dentist at Kansas City, had a stroke of paralysis Nov. 18 and is in serious condition.

F. A. BADEN, 36 years old, a dentist of Baltimore, died from heart disease, Nov. 18, at Richmond, Va.

J. A. MAYER, a dentist of New York, was found dead in the Harlem River recently, and foul play is suspected.

FALSE DOCTRINE was recently defined by a school-boy as "when the doctor gives the wrong stuff to people who are sick."

QUITE SUFFICIENT.—Doctor: Have you been able to keep anything on your stomach? Patient: Nothing but my hand.—*Life*.

G. H. SLYFIELD, 39 years old, and formerly a dentist at Waukegan, died Dec. 9, at San Antonio, Cal., from consumption.

DIVORCE.—Nov. 25 Mrs. Mary E. Slonaker was granted a divorce from her husband, J. W. Slonaker, a dentist of Chicago.

ACCIDENT.—Nov. 19 a vulcanizer in the University of Buffalo Dental Department blew up and slightly scalded several students.

DENTIST AS DUELIST.—F. C. Wilson, a dentist of Savannah, Ga., and J. S. Schley, a cousin of Admiral Schley, have challenged each other to fight a duel to the death.

SPRINGFIELD (O.) DENTAL ASSOCIATION held its annual meeting Dec. 8, and elected the following officers: President, W. A. Barber; Secretary and Treasurer, P. Willwine.

NEW DENTAL COLLEGE.—The Northern College of Dental Surgery of Chicago was licensed Nov. 18. The capital is \$2,500, and the incorporators are F. F. Tollkuehn, A. D. Radcliffe and E. F. Neal.

CEDAR RAPIDS (IA.) DENTAL SOCIETY held its annual meeting Nov. 14, and elected the following officers: Pres., L. E. Richardson; Vice-president, J. B. Hepler; Treasurer, S. G. Grove; Secretary, J. H. Calder.

CLEVELAND DENTAL SOCIETY held its annual meeting Dec. 1, and elected the following officers: President, S. J. Spargur; Vice-president, J. W. McDill; Secretary, W. H. Ramaley; Treasurer, Frank Ackerman.

WEIGHT WANTING.—Reports come in from time to time that dentists have been cheated by selling their gold scraps to men who used short-weight scales. Better send your scrap to some reputable supply house or refiner.

BELOIT (WIS.) DENTAL ASSOCIATION held its annual meeting Dec. 15, and elected the following officers: President, G. A. Cleophas; Vice-president, J. A. W. Meyers; Secretary, E. S. Pettitt; Treasurer, James Bradley.

ALTRUISTIC.—Dentist: You look as though you had been suffering from toothache. Woman: Yes, I haven't slept a wink for two nights. Dentist: Let me see the tooth. Woman: Oh, it's my husband's.

SYRACUSE, N. Y., DENTAL SOCIETY held its annual meeting Dec. 2, and elected the following officers: President, W. F. Engle; Vice-president, A. M.

Lafayette; Secretary and Treasurer, C. M. Ryan; Corresponding Secretary, C. H. Barnes.

MILWAUKEE DENTAL SOCIETY held its annual meeting Dec. 2, and elected the following officers: Pres., A. Gropper; Vice-president, W. S. Griffiths; Secretary and Treasurer, A. F. Kortebein; Member Board of Censors, W. A. Perkins.

POOR-HOUSE FOR DENTIST.—M. F. Buckley, formerly a capable and successful dentist of Boston, was recently arraigned in the police court on the charge of vagrancy and sent to the state farm for a year. Drink and drugs caused his downfall.

WEDELSTAEDT DENTAL CLUB was organized Dec. 17 at Cedar Rapids, Ia., with a membership of thirty, and the following officers were elected: President, W. R. Clack; Vice-president, J. B. Conzett; Secretary and Treasurer, Wm. Finn.

COUNTY DENTAL SOCIETY held its annual meeting at Watertown, N. Y., Dec. 8, and elected the following officers: President, G. E. Coe; Vice-presidents, W. G. Smith, P. E. Dowe, B. N. Bailey, Fred Hosley; Secretary and Treasurer, R. A. Clarks.

CONNECTICUT DENTAL CLUB, organized to honor the memory of Dr. Horace Wells, held its eighth annual meeting Dec. 12, and elected the following officers: President, Henry McManus; Vice-president, A. C. Fones; Secretary, Charles McManus.

NECESSITY CREATED.—When at last a physician came and settled among them, the people wondered. "Nobody is ever sick here," they said. "Of course not, with no medical assistance at hand," said the doctor, smiling at their simplicity.—*Life*.

JAW-BREAKERS.—We copy the following from the catalogue of a Swedish dental supply house: Pimpstenspapperstrissor, Karborundum-Kautschukslip-spetsar, Kvicksilfverbehallare. The dealers of this country have much for which to be thankful.

LOS ANGELES ASSOCIATION OF DENTAL ALUMNI met Dec. 4, and elected the following officers: President, J. D. Moody; Vice-president, H. D. Reque; Secretary and Treasurer, G. M. Crow; Corresponding Secretary, J. F. Cook; Board of Directors, A. T. Covert.

COFFEE AND PYORRHEA ALVEOLARIS.—The use of coffee hinders the elimination of tissue-waste, and is therefore injurious in the presence of gout and rheumatism. It should be forbidden by the dentist to the patient whom he is treating for pyorrhea.—J. B. ERNSMERE, *Cosmos*.

TEMPERATURE AT WHICH TO POUR ZINC.—Thrust into the molten zinc a piece of dry white pine; if it chars badly the metal is too hot; if it chars very slightly—say a coffee-brown—it is about right. The cooler you can pour the zinc the better it will flow.—*Dental Of. and Lab.*

NURSES MUST HAVE GOOD TEETH.—A training school for nurses at Cleveland has announced that all applicants must present with their teeth in good

order. This is a commendable decision and could well be followed by all schools for nurses throughout the country.

INDICTMENT FOR DENTIST.—Last month we announced that H. Gulmyer, a dentist at Elkhart, Ind., had shot a young woman of whom he was jealous. Contrary to expectations, she is getting well, but the grand jury has indicted the dentist and he will be tried for attempted murder.

THE DENTAL WORLD.—The editors of this publication announce in the December issue that it will appear no more. It was the official organ of the Georgia, Florida and South Carolina dental societies, but did not receive sufficient support to warrant its backers in continuing publication.

NEW HAVEN (CONN.) DENTAL CLUB held its fourth annual meeting Dec. 9, and elected the following officers: President, W. H. Metcalf; Vice-president, W. S. Horton; Secretary, G. W. Johnston; Treasurer, R. M. Gaylord; Ex. Com., E. S. Gaylord, Chairman, F. W. Brown, H. S. Bascom.

LOCATIONS.—S. F. Scott, a physician at Waukomis, Oklahoma, states that any dentist wishing a location can secure one by writing him.—The postmaster at Moulton, Ia., writes that the town needs a good dentist, having a population of 2,000 and only one old-school dentist to look after it.

ST. LOUIS DENTAL SOCIETY held its annual meeting Dec. 2, and elected the following officers: President, T. E. Turner; 1st Vice-president, H. Prinz; 2d Vice-president, C. D. Lukens; Corresponding Secretary, DeCoursey Lindsey; Recording Secretary, J. F. Austin; Treasurer, J. G. Pfaff; Librarian, G. H. Gibson.

FIRES.—C. H. Hayward, Peterborough, N. H., Dec. 7, loss \$1,000, insurance \$400.—C. S. Kyes, Peterborough, N. H., Dec. 7, loss \$500, no insurance.—G. C. Smith, Centerville, Md., Dec. 14, total loss.—F. Hefner, Monticello, Ia., Nov. 30, total loss.—J. G. Atterberry, Tecumseh, Neb., Nov. 30, loss \$800, insurance \$600.

HARDENING PLASTER CASTS.—Dissolve boric acid in warm water and add sufficient ammonia to form the borate which remains in the solution. Use cold, either employing the liquid in mixing the plaster or applying it to the surfaces with a brush. The surface becomes hard after two days; the interior more slowly.—*Medical News.*

NEW JERSEY DENTISTS TO COMBINE.—The Central Dental Association of Northern New Jersey has decided to compile a list of all "deadbeat" patients known to its members, and to furnish a copy of this list to every dentist belonging to the organization. It would be well if the dentists of every city in the country would do the same.

INDIANA AFTER FAKIRS.—The Indiana State Dental Association is trying to have a law enacted so that all applicants for registration shall be examined by the state board, whereby protection will be given to the reputable dentists and to the community at large against advertising "fly-by-nights." In other words, dentists want the same protection that is given physicians.

TEMPERING STEEL TOOLS.—Two cold-chisels, heated to a cherry-red and tempered—the one in a solution of carbolic acid and the other in water—were set

to work on extra hard wrought iron. It was found that the one tempered in water became notched after a short time, while the one tempered in carbolic acid remained perfectly intact.—M. LEVAT, *The Engineer*.

ILLEGAL PRACTITIONERS.—Dec. 9 a dentist at Victor, Colo., was fined \$100 for practicing without a license. His defense was that a permit had been given him several years ago and he supposed same was still good. Dec. 17 a dentist at Tecumseh, Va., who was practicing without a license, concluded that discretion was the better part of valor, and left for parts unknown.

FATALITIES.—Nov. 13 a man at Lewiston, Me., swallowed his false teeth and died from strangulation.—Dec. 17 a man at Norristown, Pa., had a tooth extracted and during the process his jaw was fractured. Blood-poisoning set in and his condition is serious.—Dec. 12 a woman at Covington, Ky., had a tooth extracted, and remained in a state of apparent coma for several hours afterwards, but finally recovered.

DENTIN OBTUNDENT.—Solution of ammonium carbonate. *Preparation:* Sublimation of one part of ammonium chlorate and two parts of chalk, and solution in four parts cold water. The liquor is volatile and has only a faint ammoniacal odor. To be applied in five to twenty per cent solution; acts in five to ten minutes. Can be recommended. Cannot be used for hypodermic injection, but the anesthesia produced is very efficient.—DR. THIERSING, *Register*.

ROBBERIES.—Dec. 22, Dr. L. C. Drake of Chicago lost \$100 through thieves.—Dec. 21, Dr. B. J. Cigrand of Chicago was robbed of \$1,100 worth of stuff.—Dec. 3, a dentist at Peoria, Ill., lost \$50 through sneak thieves.—Nov. 22, a dentist at St. Louis was robbed of \$50 worth of material.—Nov. 24, a woman at East Hamilton, O., left her pocketbook in the dentist's waiting-room while she was in the chair, and a young boy confiscated it and some other portable articles.

GUAIACOL IN THE EXTRACTION OF TEETH.—Guaiacol (chem. pure), 1 gram; olive oil (sterilized and neutralized), q. s. to make 10 c.c. For hypodermic injection, for tooth extraction, the effect of guaiacol is at least equal to that of cocain, and in certain cases in which the cocain does not produce the desired effect, as in periostitis, pure alveolar abscess and radicular cysts, guaiacol produces perfect analgesia. Being entirely non-toxic and not caustic its use as an agent for the painless extraction of teeth should become general.—DR. P. MARECHAL, *Cosmos*.

ZINC IN A VULCANIZER.—R. E. Luther, Batavia, N. Y., in *Brief*. If any member of the profession is following the suggestion in *British Journal of Dental Science*, about putting zinc in the vulcanizer for the purpose of keeping the flask clean, he will find himself in trouble in a short time. Zinc in a vulcanizer will in a short time decompose hot water, evolving hydrogen; and when there is enough of it to replace the steam the regulator will be operated by hydrogen pressure and the heat will go down, causing the plate to come out soft at the end of the vulcanizing time.

EXAMINING BOARD AFFAIRS.—At the last meeting of the Massachusetts

Board of Dental Examiners forty-seven candidates were examined and nineteen passed.—At the last meeting of the Connecticut State Board of Dental Commissioners sixteen candidates out of twenty-three passed the examination.—C. G. Gray of Petoskey has been appointed a member of the Michigan Examining Board to succeed F. O. Gilbert of Bay City.—Nov. 17, the California State Board elected the following officers: President, C. A. Herrick; secretary, F. G. Baird, San Francisco; treasurer, J. M. Dunn.

CANCER AND CARBONIC ACID.—There is a remarkable coincidence between the spread of cancer and the largely increasing consumption of effervescent wines and waters. Prior to the sixties champagne as a drink was used but occasionally, nor were aerated waters consumed in anything like the quantity or frequency that they now are. The upper classes by constantly imbibing effervescent beverages, solutions of carbonic acid of greater or less strength, so prepare their mucous tissues as to make them a favoring host to the cancerous fungus, if fungus it be.—*London Medical Times*.

IT SHOOK HIS FAITH.—(From the *Syracuse Herald*.) Little Harold had been told in Sunday school that the Lord would heal in answer to prayer. A thunderstorm happened to be raging at the same time Harold had a jumping toothache, and his mother overheard this: "Oh, Lord, stop my toothache." Silence for thirty seconds. "Oh, Lord, please do, for heaven's sake, stop my toothache." More silence; then a crash of thunder, then: "Oh, Lord, please do stop that durn thunder long enough to listen to me." The next day Harold had his tooth pulled, and now he wouldn't be a Christian Scientist for \$1 cash and an air gun.

IMPRESSIONS OF THE FACE.—Oil the face with white vaselin and put a head-cap on, to prevent the plaster from falling into the hair. Put plaster all across the forehead and sides of the face, to prevent the impression from sagging, and after the plaster has been flowed up to the alæ of the nose, insert a tube so that respiration is not interfered with. The plaster should then be built over the central portion of the face and nose. In using slow-setting plaster use wet towels to keep the face cool. Remove the plaster cast down, pulling off toward the center of the nose. Varnish the impression with sandarac, then use soap as a separating medium.—*Western Dent. Jour*.

ADVERTISEMENT EXTRAORDINARY.—A Paris dentist advertises to speak French, English, Russian, Polish, Italian, Spanish, Portuguese, and then modestly announces in English: "It is quite unnecessary to extract the teeth with the new system discovered by the American doctor. New application made by electricity at each operation without any danger and sufferings. Set of teeth aluminium-enameled strong and solid weighing 3 gramm. Without springs and hooks. The teeth cannot moving in speaking nor eating. The word, the voice, nor the smell are touched. Appearance of artificial teeth cannot be seeing at the mouth's examen. All are entirely hygienic: each part are accessible to the brush—any particule of food cannot stay in the interstices; by this mode they occupied the place of exactly natural teeth and stay much longer time that any system of artificial teeths."

DISINFECTION OF INSTRUMENTS.—The official spirit of soap of the German

Pharmacopeia offers a convenient means of effectually sterilizing surgical instruments. This spirit is made by combining six parts of olive oil with seven parts of caustic potash, subsequently diluting with thirty parts of alcohol and seventeen of water. The caustic action of the potash is neutralized by the olive oil and water.

Instruments thoroughly washed with this solution, or simply wrapped snugly in cotton saturated therewith, may be kept aseptic for considerable periods of time. Exclusion of air is an important consideration.

The same agent may be employed to disinfect the hands of the operator, or skin of the patient, as it is harmless even when applied in full strength.—*Deut. Med. Zeitung.*

MARGINAL ULCERATION OF THE GUMS.—Neil Macvicar describes a disease, called among the natives of East Central Africa, Chikusa, which is unpleasant and painful, although not dangerous to life. Ulceration begins at a spot on the alveolar margin of the gum, and in a few days spreads two inches or so along the gum. The ulcerated surface has an eaten-out appearance, discharges dirty pus and is speckled with blood clots. The roots of the teeth become exposed and the teeth loosened. The disease lasts for weeks. The cause is probably a specific microorganism, whose nature is as yet unknown. Many patients are well nourished and cleanly in the care of their teeth. A moderately strong solution of the permanganate of potash used as a wash, or applied with a camel's hair brush half a dozen times a day or more, will, in a few days, cure even the worst cases.—*Jour. Tropical Med.*

MARRIED.—W. J. Barnaby, Cedar Rapids, Ia.; Lulu Keys, Atwater, O., Nov. 19.—E. T. Evans, Decatur, Ill.; Grace Radcliffe, Frederick, Md., Nov. 12.—Gny Fraker, Shelbyville, Ill.; Neva French, Shelbyville, Nov. 27.—C. C. Harris, Providence, R. I.; Gertrude Harris, Norwich, Conn., Nov. 25.—F. B. Holcomb, Cherry Creek, N. Y.; Blanch M. Curtiss, Cherry Creek, Dec. 17.—H. P. Hopkins, Little Rock, Ark.; Nora C. West, Clarendon, Ark., Dec. 4.—J. W. Lawrence, La Crosse, Wis.; Jessie P. Bailey, La Crosse, Dec. 11.—P. W. Lenze, St. Louis; Emma Steinbach, Quincy, Ill., Dec. 3.—Charles Malson, Whitesboro, N. Y.; Bessie Teller, New York City, Dec. 2.—G. V. Milholland, Baltimore; Ella C. Gordon, Baltimore, Nov. 19.—E. C. Stowell, Ossian, Ind.; Louise Walsh, Valparaiso, Dec. 4.—L. A. Wood, Loraine, O.; Edith Wood, Elyria, Dec. 10.—H. M. Whitby, Houston, Tex.; —, Nashville, Tenn., Dec. 10.

SUPRAORBITAL REFLEX.—D. J. McCarthy states that the upper part of the face is richly supplied with sensory nerve filaments from the fifth nerve, all of which are accessible to mechanical or sensory irritation. A careful study of the reflexes in this area will show that there are several independent and distinct reflexes, as follows: (1) A pure sensori-motor reflex, in the nature of a skin-muscle reflex, elicited from the supraorbital distribution exclusively; (2) A periosteal reflex may be obtained when there is an excited condition of the reflexes, by irritation (percussion) over the malar arch or the perios-teum of the nose (v. Bechterew, Overend); (3) The corneal and conjunctival reflexes may be obtained by irritation of these structures; (4) The cor-

neomandibular reflex of v. Solder is a lateral movement of the lower jaw, produced by irritation of the cornea.—*Phila. Med. Jour.*

DAMAGE SUITS.—Last June a woman in Toronto had twelve teeth extracted. Soon after she became ill with bronchial pneumonia, and in July coughed up a tooth. She recently sued the dentist for \$200 damages, but he denied that he pulled the tooth in question, and stated that it was out when the woman first came to him. The jury held him blameless.—A dentist in Racine recently sued a man to recover a balance due of \$50 for services. The patient brought in a counter claim for \$175, but the jury found for the dentist, and the court ordered the patient to pay the bill and stand the costs in the case.—A woman in Rochester recently sued a dental parlor for \$100 damages. She went there to have some teeth extracted, and the operator gave her "vitalized air." She claimed that it made her so sick that she spoiled a new silk dress, and that her jaw was injured. The court, however, decided that the dentist was not to blame.—A woman in Syracuse, N. Y., has sued a dentist for \$500 damages, alleging that when extracting a tooth he did not do the work properly and that he was not licensed to practice.

TONGUE IN ACUTE MALARIAL INFECTION.—Lucien Loften calls attention to the fact that in acute malarial infection the tongue exhibits one or two (generally two) dark lines, running from the base of the organ to the apex, and usually separated by a clearly defined tract of clean mucous membrane about one-sixteenth to one-eighth of an inch wide. These lines are pyramidal in appearance, and begin among the large papillæ at the base of the tongue. They vary in width, and may be from one-eighth to one-quarter of an inch wide, gradually coming to a point in the middle of the tongue. In color they resemble the stain of a 10 per cent solution of potassium permanganate that has been exposed to the air for some time. They are quite different from the discoloration seen in users of tobacco and snuff, and, when once carefully noted, are thereafter easily recognized. This condition will most likely be found from one day to two weeks after exposure or inoculation. It remains in some individuals longer than in others, notably in the negro. It is more beautifully defined from six to twelve hours after the initial sporulation, and remains until the system is thoroughly cinchonized.—*N. Y. Med. Jour.*

HUMAN INCUBATOR.—A Kentucky farmer, Filson by name, lay sick with a fever so high, the account goes (*Popular Mechanics*), that it notably heated the whole bed coverings. He was the breadwinner of the family, but his wife was a resourceful woman. Seeing her husband's energies going altogether to waste in uselessly raising the local temperature of his immediate surroundings, the thought occurred to her of a way of utilizing them to her and her family's profit. Borrowing some four dozen eggs she placed them in the bed, securing them from danger of breakage by some simple arrangement, and in due time hatched out in this novel incubator, 44 chickens, to the great delight of the father of the family and herself. Perhaps the emotional condition influenced the disordered heat centers, for it is said with the appearance of the newly hatched brood the fever subsided, at least this is an allowable *post hoc* conjecture. Continued fever is not a pleasant matter,

as a rule, but the woman of the above story, which is given as a veritable history, deserves credit for her ingenious utilization of adversity and the conclusion certainly is cheerful. Father and chickens are reported as crowing over their outcome.

SALIVARY SECRETION IN NERVOUS DISEASES.—A. Acquaderni reaches the following conclusions: Sialorrhea is found in many nervous affections, and is a symptom to be classed with polyuria, glycosuria, and icterus. It is produced either by direct irritation of the salivary center (affection of the medulla), or by abolition of the cerebral moderating influence, or stimulation of the secretory tracts of the hemispheres (softening hemorrhages), or reflexly through some lesion irritating the sensory nerves (neuritis—*tic douloureux*). In central paralysis of the facial nerve the salivary secretion of the affected side does not appear to be modified, and in no case is it diminished, but if anything increased. In peripheric facial paralysis there is diminution or abolition of the secretion, according to the severity of the lesion. Prognosis of sialorrhea depends upon the affection in which it occurs; in some it indicates the progress of the disease, and in the absence of other bulbar symptoms indicates involvement of the medulla (labio-glossal laryngeal paralysis, *tâbes*, anyotrophic lateral sclerosis). Persistent and prolonged sialorrhea may, independently of the disease causing it, considerably aggravate the bad condition of the patient.—*Rivista Critica di Clinica Medica*.

SURGICAL ASEPSIS AND ANTISEPSIS.—With the view of determining the value of antiseptics in surgical work, and to what extent asepsis of the operative site and wound could be obtained, Gangitano (*La Riforma Médica*) made a series of experiments, with the following findings: (1) The skin cannot be made absolutely sterile, as the deeper strata remain septic, despite all aseptic and antiseptic measures. (2) A pack of soft soap or a one per cent solution of formalin applied the day before operation renders the superficial skin sterile in 30 per cent of all cases. Bichlorid produces sterility but once in ten times. (3) Sutures become infected in their passage through the deeper layers of the cutaneous tissue, as shown by cultures from sutures passed through skin which is superficially sterile. (4) The path of a suture may be sterilized by passing the needle which carries the thread through a flame immediately before the stitch is taken. A fine needle should be used, and introduced rapidly; a coarse needle, slowly introduced, produces injury to the tissues. A fresh needle and suture for each stitch are essential to the success of this method. (5) Cultures from wet dressings show presence of bacteria which live only in moist surroundings; a dry dressing is to be preferred.—*Medical News*.

REFLEX VALUE OF WORK WITH THE MICROSCOPE.—There is nothing, I believe, quite equal to work over the microscope for sharpening one's critical faculties as brought to bear upon almost every department of our professional labors. The degree of the perfection of our work depends upon two prime conditions; the acuteness of our perception as to what is really needed in the adaptation of means to ends, and the ability to put into execu-

tion the ideal formed in the mind. Work with the microscope is certain to very greatly enlarge and improve the first of these conditions; and when the critical faculty is keen and alert, when the ideal of an enlarged vision becomes fixed on a high plane, the fingers will slowly respond to this ideal almost unconsciously. Take an extracted tooth and prepare a cavity in it. Fill the cavity with gold and finish in your usual manner. Now examine your work with a magnifying power of from twenty-five to fifty diameters. You will be impressed, as you never have been before, with the merely relative nature of the perfection of your work. You will see numberless grooves and crevices where the microorganisms causing decay may possibly find lodgment and thus begin anew their work of destruction. The knowledge thus gained will, as I have said, almost involuntarily work itself out in the fingertips, and your operations will reach a higher level of perfection.—J. LEON WILLIAMS.

SOLUBLE MATRIX.—W. W. BELCHER: I have been using for the past year a new matrix of my own devising. It has a limited application, but fills a place impossible with any other. In the use of the removable band matrix it has always been my fear that while in a plastic condition the filling might become disturbed at the cervical margin; and it occurred to me that a matrix which could be quickly applied, and the necessity of its removal obviated, would prove most desirable. This matrix is of thin gelatin, which can be procured in sheet form, or better still, as the ordinary 1 dram veterinary capsule. Gelatin is eminently soluble. On the application of moisture it can be shaped to any form. It possesses in a large degree several of the essentials of a matrix; ease of manipulation, non-irritability or injury to the tissues, and properly shaped, will not obscure the cavity. Taking a sheet of gelatin or a veterinary capsule it is held in the hand for a few moments to impart warmth and then shaped for the case in hand. The matrix is placed in position, the tooth filled, with no further attention to the matrix, as the saliva will in a short time remove all traces of it, with no risk of disturbance of the filling. Five years ago I rarely used matrices, but each day I find a new application for them, an increased satisfaction in my work; best of all a feeling of having rendered superior service and collected a fee in accordance therewith.—*Off. and Lab.*

HEMORRHAGE AFTER REMOVAL OF ALLENIDS.—Louine (*Phila. Med. Jour.*) reports five cases of severe hemorrhage following the removal of the nasopharyngeal gland in children from six to fourteen years old. In considering the causes of hemorrhage the author mentions (1) hemophilia and anemia; (2) heart disease, especially hypertrophy of the left ventricle; (3) anomalies in the nasopharynx, especially the so-called vertebra prominens; (4) the anomaly of the posterior inferior border of the septum described by Grunwald under the name of ala septi; (5) anomalies in the distribution of the blood vessels; (6) the employment of cocain, which acts first as a vasoconstrictor and then as a vasodilator; (7) a piece of the gland which remains attached by the mucous membrane only and acts as a foreign body; (8) menstruation; (9) very sharp instruments; (10) acute catarrhal condi-

tion of the upper respiratory passages accompanied by engorgement of the blood-vessels. As to treatment, the hemorrhage, if not very severe, may be controlled by the usual methods, such as injection of cold or hot water, insufflation of tannin, application of trichloracetic acid, ferropyrin, extract of suprarenal gland, getol, dermatol, etc. The author found in ferropyrin an excellent hemostatic in slight hemorrhages, used in a five-per-cent solution of gelatin. If no success follows the application of the above methods, tamponage should be resorted to, but only as a last resort, and with great caution in the case of small children, as in them the tampon causes obstruction of deglutition and breathing and may lead to complications in the ear. As a preventive against subsequent hemorrhage, complete rest for several days after the operation should be insisted upon.

FIBRO-SARCOMA OF SOFT PALATE AND TONSIL.—Dr. C. M. Robertson narrated the case of a farmer, aged 62, who, while picking his teeth with a straw, pricked the left tonsil, causing only slight pain. In a few days he noticed a small swelling above the left tonsil, which increased rapidly in size till the end of eight weeks, when he presented himself for relief. At this time the patient experienced great difficulty in breathing, and it was almost impossible to swallow food. Upon examination, a large tumor was found occupying the left palatal arch, well down to its base, involving the tonsil and side of the pharynx as far as the epiglottis, and up behind the edge of the hard palate as far as the left Eustachian tube. It extended forward into the mouth to within one inch of the incisor teeth. The growth was smooth in contour, lighter in color than the surrounding tissues, and firm and elastic to the touch. Under cocain a piece of the growth was removed for microscopic examination and pronounced fibro-sarcoma. The following week the growth was removed under chloroform anesthesia. It was found to be encapsulated, and on this account a favorable prognosis was made. In looking over the literature I find some 25 cases reported of sarcoma of the soft palate and 45 additional cases of sarcoma, where the soft palate and tonsil or tonsil alone were involved. In nearly all the cases the growth was removed by external operation, and in these cases recurrence was frequent, whereas the encapsulated growths removed by the mouth were not so prone to recurrence. The case under consideration has as yet shown no signs of new growth, twenty months having elapsed, and therefore I feel justified in reporting it as a cure.

Dr. E. F. Ingals recalled the case of a boy of 13, upon whom he operated and removed a fibro-sarcoma in 1883, through the natural passages. The tumor soon showed a tendency to recurrence, but as the patient was in the city alone and fell into bad company, I was obliged to send him to his home in a distant state. He came to see me again sixteen years afterward for pain in the chest, apparently of rheumatic origin. He stated that after returning to his home the first time the tumor had grown so as to cause complete nasal obstruction, and great prominence of the right cheek, and to destroy sight in right eye, but after a few years it had almost completely disappeared by atrophy.—*Jour. A. M. A.*

A D. D. S. EPITAPH.

A worthy dentist rests beneath
 This high-heaped, grassy mound;
 True man was he, although his teeth
 Full often false were found.

All obstacles he did despise,
 And often would he brag,
 He rather liked, than otherwise,
 To run against a snag.

Much suffering did he assauge,
 His patients lost éach pang,
 Though erst the throbbing tooth might rage,
 As they his door bell rang.

His speech was frequent and most free,
 Right seldom would he pause,
 Although a masterhand was he
 At holding others' jaws.

He owned no family or clan,
 But gave all satisfaction,
 For all agreed he was a man
 Of excellent extraction.

He died without a sob or groan,
 He lived in decent gravity,
 And now, beneath this mossy stone,
 He's filling his last cavity.

(Copied by Dr. F. C. Barlow, Jersey City, from an old scrap-book.)

TIC DOULOUREUX. By Chipault and A. F. Plicque.—Static electricity seems to have a special action in hysteric tic douloureux, but isolation usually proves the most effectual of all measures in these cases. Potassium bromid is useless in epileptiform tic douloureux, but is sometimes beneficial in cases associated with true epilepsy. Several remarkable cures of this kind have recently been published. Strontium bromid seems to be even more effectual. The bromid must be pure, free from all traces of baryta. Total peripheral resection of the nerve involved has resulted in some cures without recurrence for years, but in case of a primary or secondary "Gasseritis" peripheral resection is, of course, useless. When the pain is in the deep-seated portions of the nerves, the Gasserian ganglion should be resected without wasting

time on peripheral measures. Resection of the superior ganglion of the sympathetic is a benign intervention and is proving very effective. Recurrence is liable at first, but the recurrence is much less severe and is liable to yield to therapeutic measures previously quite ineffectual. Resection of the ganglion has a vasomotor influence on the Gasserian ganglion and also on the peripheral branches and bulbar centers of the trigeminal. The harmlessness of this operation and its far-reaching influence promise a future for it in the treatment of certain facial neuralgias.—*Presse. Med.*

RECOVERY FOR PHYSICAL INJURIES CAUSED BY FRIGHT.—The Supreme Court of Iowa says, in the case of *Watson vs. Dilts*, that many cases have been before the courts in which the question of a recovery for mental pain alone, and for physical disability produced by fright, unaccompanied by physical impact, have been decided; and the decisions on these questions are in conflict, though it is probably true that the numerical weight of authority denies the right of action. But the cases so holding are not in harmony as to the reasons given for denying the right of action; some of them hold that the injury is not the proximate result of the alleged negligent or wrongful act, while others refuse a recovery for the reason that it is practically impossible to satisfactorily administer any other rule and serve the purposes of justice. A large majority of the cases which hold to the doctrine that no recovery can be had are cases in which the simple charge of negligence was made, and in many of them no claim was made for physical disability resulting from the fright. In this case, the person sued for damages stealthily invaded the home of the party suing in the night time. When he entered and went to an upper room, she did not know who it was, nor his purpose and intent in thus breaking in. She called to her husband to follow him, which he did; and, in her apprehension of danger, she followed her husband up to a room, where she found them in what appeared to be an encounter, and an assault upon her husband. From her great fright thereat, she averred that her nervous system completely gave way, and that she suffered physical injuries from the fright. The court says that its attention has not been called to any case where the facts averred precisely paralleled those in this case, nor has it discovered anywhere the facts alleged so strongly condemn the unlimited rule contended for that no recovery can be had for physical injuries caused by fright. The object of the invasion of the home in such manner was immaterial. Suppose that the object was to ransack the house, and steal therefrom; that the man went in masked, and with a deadly weapon in his hand. His discovery there under such circumstances might well cause alarm for the boldest man, and, if it produced nervous prostration and physical disability, the theory, no matter what its reason, that would say there was no actionable wrong, the court says, would be too fine spun and too cold for its sanction. Nor could it be said, under such circumstances, that the prostration resulting from the fright so caused was not the proximate or probable result of the party's act. It is within the common observation of all that fright may and usually does affect the nervous system, which is a distinctive part of the physical system, and controls the health to a very great extent, and that an entirely sound

body is never found with a diseased nervous organization; consequently, one who voluntarily causes a diseased condition of the latter must anticipate the consequence which follows it. The nerves being, as a matter of fact, a part of the physical system, if they are affected by fright to such an extent as to cause physical pain, it seems to the court that the injury resulting therefrom is the direct result of the act producing the fright. But each case must, of necessity, depend on its own facts.

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